Operator's Safety and Service Manual RAMMERS

It is the OWNER'S RESPONSIBILITY to communicate information on the SAFE USE and OPERATION of this machine to the operators!

MBW INC.

250 HARTFORD ROAD • P.O. BOX 440
SLINGER, WI 53086−0440
PHONE: (262) 644−5234 • FAX (262) 644−5169

MBW CORPORATE INTERNET ADDRESS
E−MAIL: mbw@mbw.com WEB SITE: www.mbw.com

IN ENGLAND:
MBW (UK) LIMITED
Bradley Fold Trading Estate Unit 6
Radcliffe Moor Road
Bolton BL2 6RT
Phone: 01204 387784 • FAX: 01204 387797

L12219 / 06.01

TABLE OF CONTENTS

SAFETY PRECAUTIONS

READ AND STUDY THE FOLLOWING SAFETY INFORMATION BEFORE ATTEMPTING TO OPERATE THIS EQUIPMENT. IN ADDITION, ENSURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.

WARNING – LETHAL EXHAUST GAS!

An internal combustion engine discharges carbon monoxide, a poisonous, odorless invisible gas. Death or serious illness may result if inhaled. Operate only in an area with good ventilation, **NEVER IN A CONFINED AREA!**

WARNING – DANGEROUS FUELS!

Use extreme caution when storing, handling and using fuels – they are highly volatile and explosive in vapor state. Do not add fuel while engine is running. Stop and cool the engine before adding fuel. **DO NOT SMOKE!**

SAFETY GUARDS

It is the owner's responsibility to ensure **ALL GUARDS AND SHIELDS** remain in place.

IGNITION SYSTEMS

Breakerless, magneto and battery ignition systems **CAN CAUSE SEVERE ELECTRICAL SHOCKS**. Avoid contacting these units or their wiring.

SAFE DRESS

DO NOT WEAR loose clothing, rings, wristwatches, etc., near machinery.

NOISE PROTECTION

Wear O.S.H.A. specified hearing protection devices.

FOOT PROTECTION

Wear O.S.H.A. specified steel tip safety shoes.

HEAD PROTECTION

Wear O.S.H.A. specified safety helmets.

EYE PROTECTION

Wear O.S.H.A. specified eye shields, safety glasses, and sweat bands.

OPERATOR

Keep children and bystanders off and away from the equipment.

REFERENCES

For details on safety rules and regulations in the United States, contact your local Occupational Safety and Health Administration (O.S.H.A.) office. Equipment operated in other countries must be operated and serviced in accordance and compliance with any and all safety requirements of that country.The publication of these safety precautions is done for your information. MBW Inc. does not by the publication of these precautions, imply or in any way represent that these are the sum of all dangers present near MBW equipment. If you are operating MBW Inc. equipment, it is your responsibility to insure that such operation is in full accordance with all applicable safety requirements and codes. All requirements of the United States Federal Occupational Safety and Healthy Administration Act must be met when operated in areas that are under the jurisdiction of that United States Department.

SAFETY NOTICE & DECALS (EC10D ONLY)

IMPORTANT NOTICE

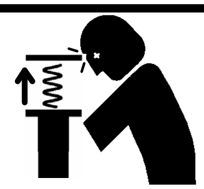
The **"SAFETY ALERT SYMBOL"** is used to call attention to items or operations that may be dangerous to machine operators or others working with this equipment. The symbol can be found throughout this manual and on the unit itself. Please read these messages carefully.

READ SAFETY DECALS CAREFULLY

Carefully read and follow all safety decals. Keep them in good condition. If decals become damaged, replace as required. If repainting, **REPLACE ALL** decals. Decal Kits are available from authorized MBW Distributors. **<u>USE DECAL SET 12101</u>**

PELIGRO

DANGER



01326

See manual for disassembly instructions.

Consulter le manuel pour le démontage correct.

Consulte el libro para ver el desmontaje correcto.

#01326, SPRINGBOX COVER

WARNING

Machine is top heavy. Attach proper safety chains to this bar when lifting.

Approximate weight: 160 lbs. (73 kg)
Model R540 only: 205 lbs. (93 kg)

13531

#13531 ON HANDLE

FUEL MIXTURE
(After break in period)

Mix 50 parts gasoline to 1 part 2—cycle engine oil (50:1).



01067

#01067, ON FUEL TANK

CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

DO NOT RUN this machine in an enclosed area. The engine produces carbon monoxide, a **POISONOUS GAS.**

Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the engine before servicing, cleaning or adding fuel.

Failure to comply could result in serious bodily injury. 13483

#13483, ON FUEL TANK (GASOLINE ONLY)

AIR CLEANER INSTRUCTIONS

CLEAN ELEMENT DAILY. MORE OFTEN UNDER DUSTY CONDITIONS. TAP ELEMENT LIGHTLY ON A FLAT SURFACE — IF DUST DOES NOT DROP OFF EASILY OR IF ELEMENT IS BENT OR CRUSHED.................. **REPLACE IT!**
WARNING: DO NOT OPERATE ENGINE WITHOUT AIR CLEANER ELEMENT — INTERNAL DAMAGE WILL RESULT!

06079

#06079, ON AIR CLEANER

OPERATING INSTRUCTIONS

1. Open fuel valve.
2. Choke engine. A warm engine may not need to be choked.
3. Set throttle at idle position.
4. Pull starter rope.
5. After starting: open choke.
6. For normal usage set throttle fully open.
7. To stop: Return throttle to idle position, press "Stop" button, close fuel valve.

01436

#01436, ON FUEL TANK (GASOLINE ONLY)

THROTTLE

RUN

IDLE

14770

#14770, ON HANDLE (RATCHET STYLE THROTTLE ONLY)

CLEAN OR REPLACE FILTER TWICE DAILY OR AS REQUIRED

M·B·W

01064

#01064 ON ENGINE SHROUD

#01060, ON AIR CLEANER

SAFETY NOTICE & DECALS (EC12D ONLY)

IMPORTANT NOTICE

The **"SAFETY ALERT SYMBOL"** is used to call attention to items or operations that may be dangerous to machine operators or others working with this equipment. The symbol can be found throughout this manual and on the unit itself. Please read these messages carefully.

READ SAFETY DECALS CAREFULLY

Carefully read and follow all safety decals. Keep them in good condition. If decals become damaged, replace as required. If repainting, **REPLACE ALL** decals. Decal Kits are available from authorized MBW Distributors.**USE DECAL SET 14768**

2-STROKE OIL 2-STROKE OIL
14774

#14774, ON OIL TANK CAP

AIR CLEANER INSTRUCTIONS

CLEAN ELEMENT DAILY. MORE OFTEN UNDER DUSTY CONDITIONS. TAP ELEMENT LIGHTLY ON A FLAT SURFACE — IF DUST DOES NOT DROP OFF EASILY OR IF ELEMENT IS BENT OR CRUSHED..................
REPLACE IT!
WARNING: DO NOT OPERATE ENGINE WITHOUT AIR CLEANER ELEMENT — INTERNAL DAMAGE WILL RESULT!
06079

#06079, ON AIR CLEANER

M•B•W
01064

#01064 ON ENGINE

UNLEADED GASOLINE
14781

#14781, ON FUEL TANK

WARNING

Machine is top heavy. Attach proper safety chains to this bar when lifting.

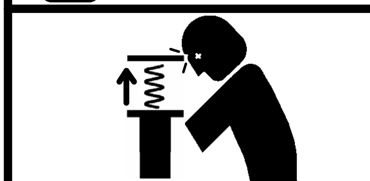
Approximate weight: 160 lbs. (73 kg)

14769

#14769 ON HANDLE

PELIGRO

DANGER



01326

See manual for disassembly instructions.

Consulter le manuel pour le démontage correct.

Consulte el libro para ver el desmontaje correcto.

#01326, SPRINGBOX COVER

OPERATING INSTRUCTIONS

1. Check fuel level
2. Open fuel valve.
3. Set throttle at idle position.
4. Choke engine. A warm engine may not need to be choked.
5. Pull starter rope
6. After starting, open choke gradually and let engine warm up at idle.
7. To start compacting: open throttle fully.
8. To stop: return throttle to idle and allow engine to run for a few minutes before turning off.
9. Turn engine switch to off and close fuel valve.

14773

#14773 ON FUEL TANK (GASOLINE ONLY)

CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

DO NOT RUN this machine in an enclosed area. The engine produces carbon monoxide, a **POISONOUS GAS.**

Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the engine before servicing, cleaning or adding fuel.

Failure to comply could result in serious bodily injury.

13483

#13483, ON FUEL TANK (GASOLINE ONLY)

THROTTLE

RUN

IDLE

14770

#14770, ON HANDLE (RATCHET STYLE THROTTLE ONLY)

SAFETY NOTICE & DECALS (AIRAMMER)

IMPORTANT NOTICE

The **"SAFETY ALERT SYMBOL"** is used to call attention to items or operations that may be dangerous to machine operators or others working with this equipment. The symbol can be found throughout this manual and on the unit itself. Please read these messages carefully.

READ SAFETY DECALS CAREFULLY

Carefully read and follow all safety decals. Keep them in good condition. If decals become damaged, replace as required. If repainting, **REPLACE ALL** decals. Decal Kits are available from authorized MBW Distributors.**USE DECAL SET 12101**

OPERATING INSTRUCTIONS

1. Connect air supply hose. **Use Safety Clips.**
2. Open air supply hose valve on compressor.
3. Squeeze actuator handle to start machine.
4. Check Airammer pressure gage. Needle should be in green area.
5. On uneven areas, pushing down on handle will aid climbing ability. **Do not bear down with excessive weight on machine.**
6. Release actuator handle to stop.

13534

#13534, ON VALVE BLOCK (AIRAMMER ONLY)

M-B-W **AIRAMMER®**

12213

#12213 ON VALVE BLOCK

TO START: SQUEEZE ACTUATOR HANDLE
TO STOP: RELEASE

13538

#13538 ON ACTUATOR HANDLE

CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the motor before servicing or cleaning.

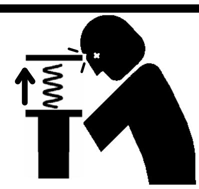
Failure to comply could result in serious bodily injury.

12203

#12203, ON VALVE BLOCK (AIRAMMER ONLY)

PELIGRO

DANGER



01326

See manual for disassembly instructions.

Consulter le manuel pour le démontage correct.

Consulte el libro para ver el desmontaje correcto.

#01326, SPRINGBOX COVER

U.S. PATENT 5,340,233

13535

#13535 ON VALVE BLOCK

WARNING

Machine is top heavy. Attach prope safety chains to this bar when lifting.

Approximate weight: 160 lbs. (73 kg)

14769

#14769, ON HANDLE

SAFETY DECAL LOCATIONS (EC10D ONLY)

FUEL MIXTURE
(After break in period)

Mix 50 parts unleaded gasoline to 1 part 2–stroke engine oil (50:1).

01067

#01067, ON FUEL TANK

OPERATING INSTRUCTIONS

1. Open fuel valve.
2. Choke engine. A warm engine may not need to be choked.
3. Set throttle at idle position.
4. Pull starter rope.
5. After starting: open choke.
6. For normal usage set throttle fully open.
7. To stop: Return throttle to idle position, press "Stop" button, close fuel valve.

01436

#01436, ON FUEL TANK

CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

DO NOT RUN this machine in an enclosed area. The engine produces carbon monoxide, a **POISONOUS GAS.**

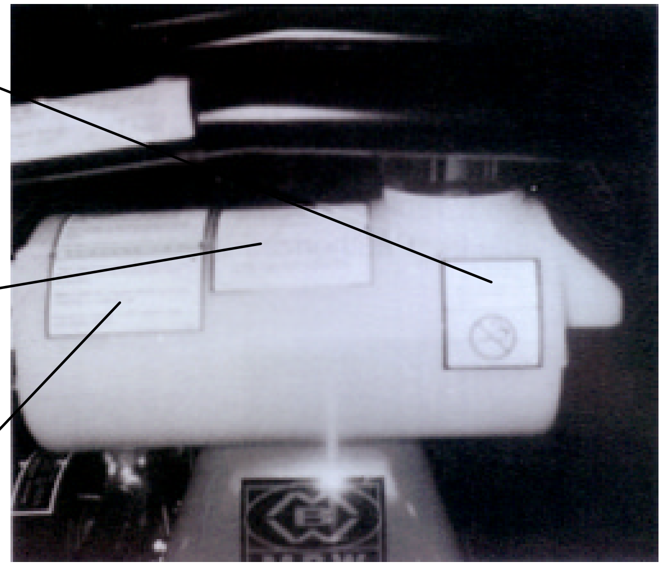
Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the engine before servicing, cleaning or adding fuel.

Failure to comply could result in serious bodily injury.

13483

#13483, ON FUEL TANK
(GASOLINE ONLY)



WARNING

Machine is top heavy. Attach proper safety chains to this bar when lifting.

Approximate weight:	160 lbs. (73 kg)
Model R540 only:	205 lbs. (93 kg)

13531

#13531 ON HANDLE

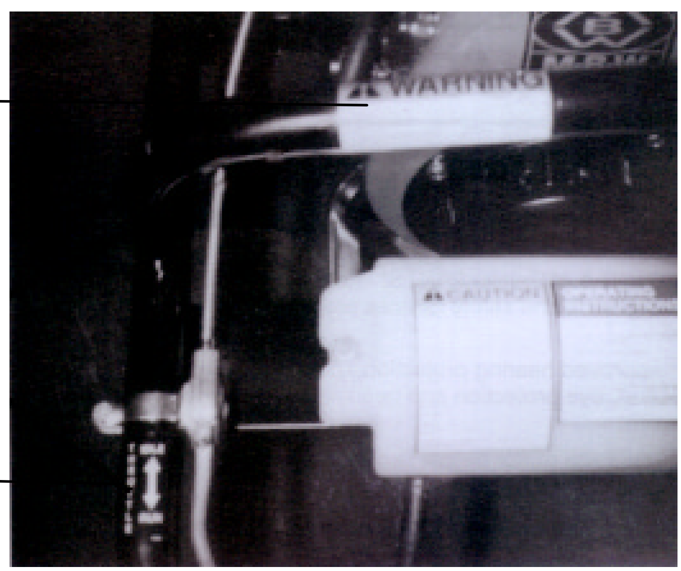
THROTTLE

RUN

IDLE

14770

#14770, ON HANDLE
(RATCHET STYLE
THROTTLE ONLY)



SAFETY DECAL LOCATIONS (CONT.)



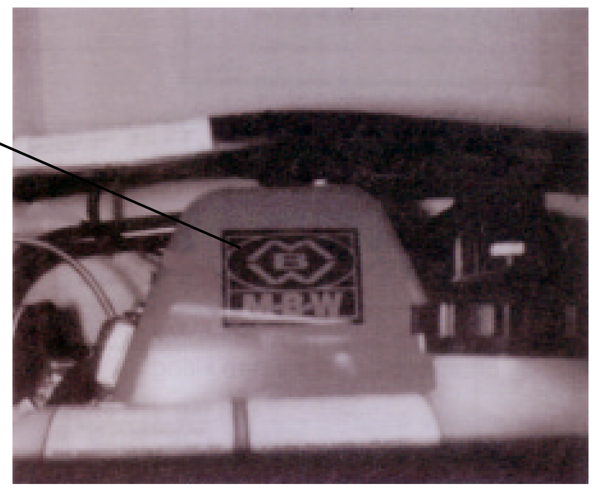
#01326 SPRINGBOX COVER



M-B-W

01064

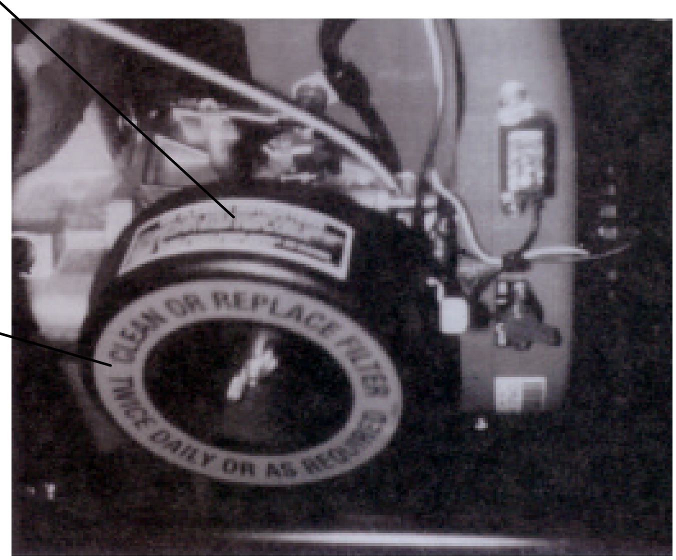
#01064 ON ENGINE



AIR CLEANER INSTRUCTIONS

CLEAN ELEMENT DAILY. MORE OFTEN UNDER DUSTY CONDITIONS. TAP ELEMENT LIGHTLY ON A FLAT SURFACE – IF DUST DOES NOT DROP OFF EASILY OR IF ELEMENT IS BENT OR CRUSHED.................. **REPLACE IT!**
WARNING: DO NOT OPERATE ENGINE WITHOUT AIR CLEANER ELEMENT – INTERNAL DAMAGE WILL RESULT! 06079

#06079, ON AIR CLEANER



CLEAN OR REPLACE FILTER TWICE DAILY OR AS REQUIRED

#01060, ON AIR CLEANER

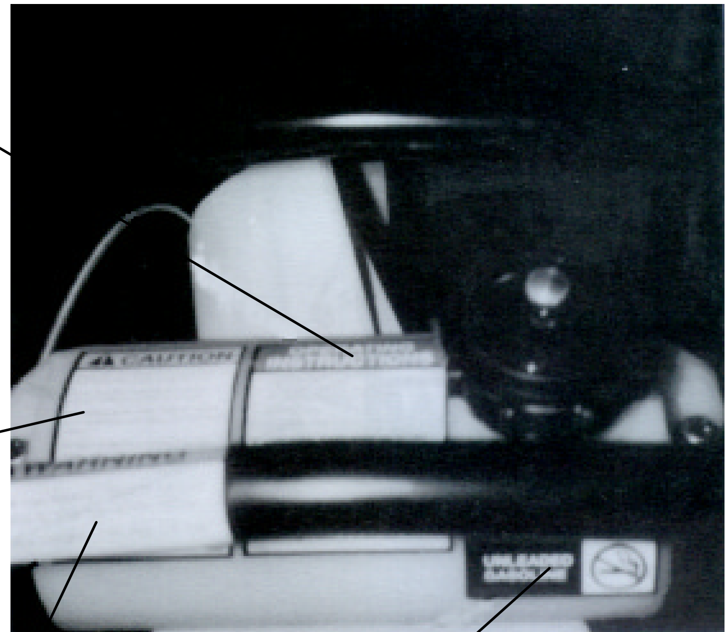
SAFETY DECAL LOCATIONS (EC12D ONLY)

OPERATING INSTRUCTIONS

1. Open fuel valve.
2. Choke engine. A warm engine may not need to be choked.
3. Set throttle at idle position.
4. Pull starter rope.
5. After starting: open choke.
6. For normal usage set throttle fully open.
7. To stop: Return throttle to idle position, press "Stop" button, close fuel valve.

01436

#01436, ON FUEL TANK



CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

DO NOT RUN this machine in an enclosed area. The engine produces carbon monoxide, a **POISONOUS GAS.**

Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the engine before servicing, cleaning or adding fuel.

Failure to comply could result in serious bodily injury.

13483

#13483, ON FUEL TANK
(GASOLINE ONLY)

WARNING

Machine is top heavy. Attach proper safety chains to this bar when lifting.

Approximate weight: 160 lbs. (73 kg)

14769

#14769 ON HANDLE

UNLEADED GASOLINE

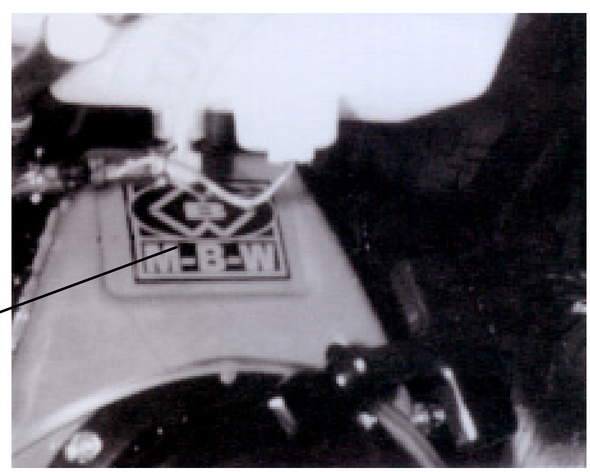
14781

#14781, ON FUEL TANK

M·B·W

01064

#01064, ON ENGINE

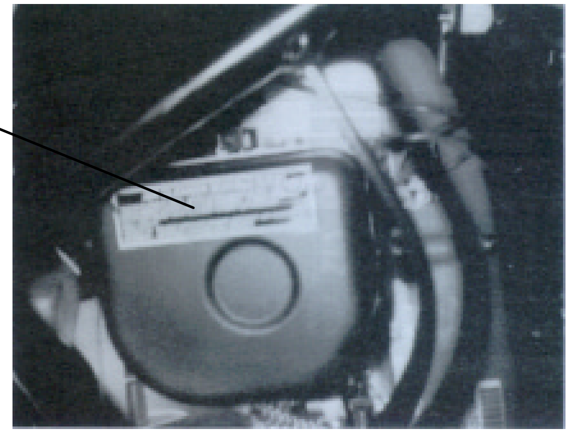


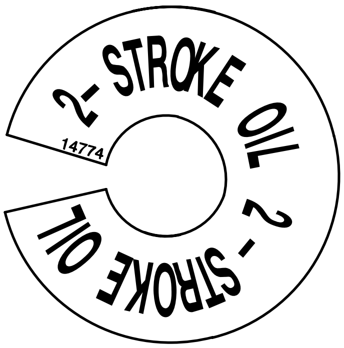
SAFETY DECAL LOCATIONS (CONT.)

AIR CLEANER INSTRUCTIONS

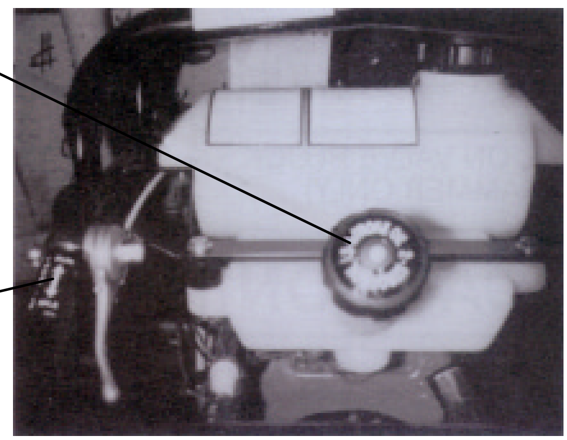
CLEAN ELEMENT DAILY. MORE OFTEN UNDER DUSTY CONDITIONS. TAP ELEMENT LIGHTLY ON A FLAT SURFACE – IF DUST DOES NOT DROP OFF EASILY OR IF ELEMENT IS BENT OR CRUSHED.................. **REPLACE IT!**
WARNING: DO NOT OPERATE ENGINE WITHOUT AIR CLEANER ELEMENT – INTERNAL DAMAGE WILL RESULT! 06079

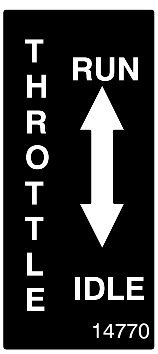
#06079, ON AIR CLEANER





#14774, ON OIL TANK CAP

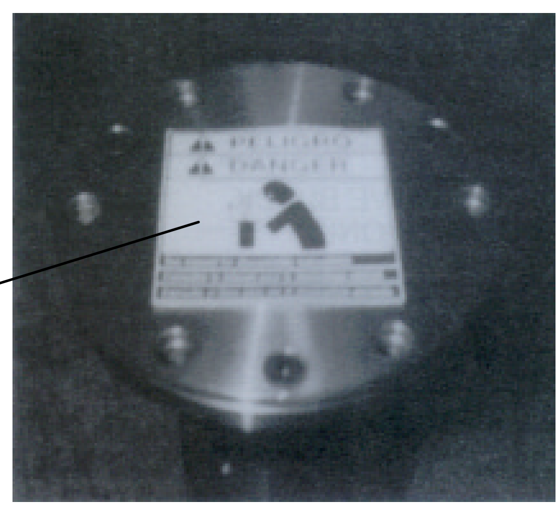




#14770, ON HANDLE
(RATCHET STYLE
THROTTLE ONLY)



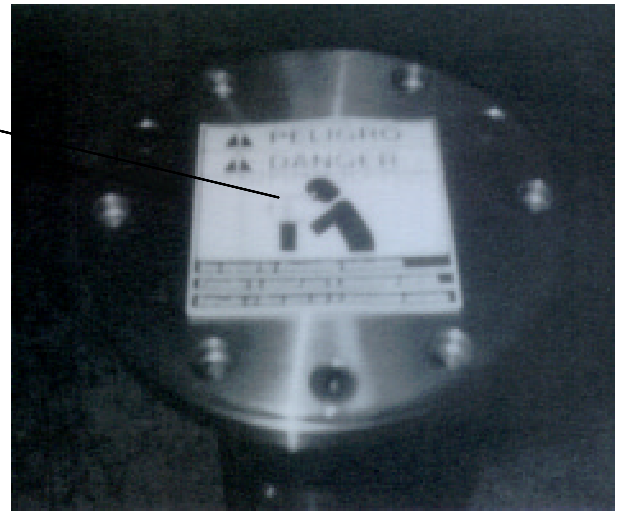
#01326, SPRINGBOX COVER



SAFETY DECAL LOCATIONS (AIRAMMER)



#01326, SPRINGBOX COVER



OPERATING INSTRUCTIONS

1. Connect air supply hose. **Use Safety Clips.**
2. Open air supply hose valve on compressor.
3. Squeeze actuator handle to start machine.
4. Check Airammer pressure gage. Needle should be in green area.
5. On uneven areas, pushing down on handle will aid climbing ability. **Do not bear down with excessive weight on machine.**
6. Release actuator handle to stop.

13534

#13534, ON VALVE BLOCK (AIRAMMER ONLY)



⚠ CAUTION

Read the Operating Instructions before operating this piece of equipment.

Keep unauthorized and untrained people away from this equipment.

ROTATING & MOVING PARTS! Make sure all guards and safety devices are in place.

Wear approved hearing protection, foot protection, eye protection and head protection.

SHUT OFF the motor before servicing or cleaning.

Failure to comply could result in serious bodily injury.

12203

#12203, ON VALVE BLOCK (AIRAMMER ONLY)

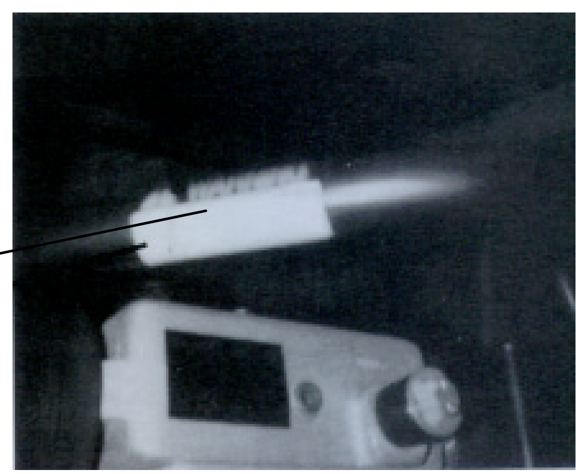
⚠ WARNING

Machine is top heavy. Attach proper safety chains to this bar when lifting.

Approximate weight: 160 lbs. (73 kg)

14769

#14769 ON HANDLE

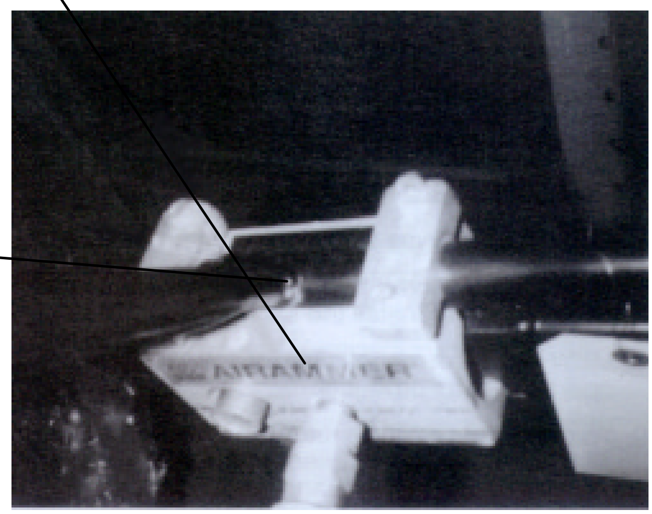


SAFETY DECAL LOCATIONS (CONT.)

M-B-W **AIRAMMER**®

12213

#12213 ON VALVE BLOCK



U.S. PATENT 5,340,233

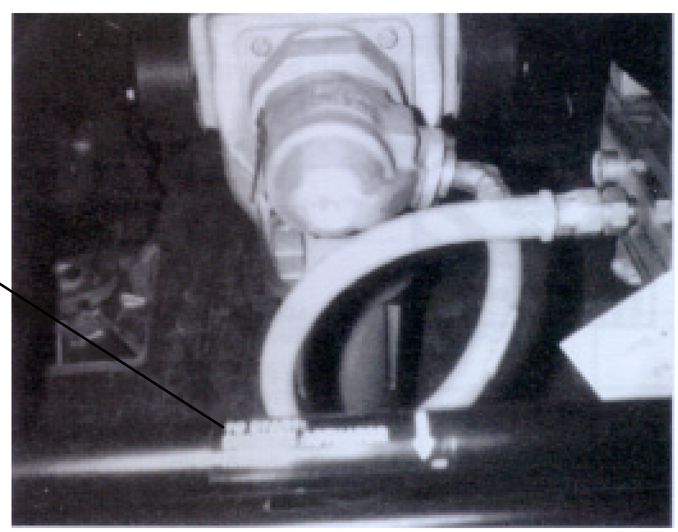
13535

#13535 ON VALVE BLOCK

TO START:
SQUEEZE ACTUATOR HANDLE
TO STOP: RELEASE

13538

#13538 ON ACTUATOR HANDLE



WARRANTY

WARRANTY

THIS IS YOUR WARRANTY — PLEASE READ AND SAVE

1. MBW INC, Slinger Wisconsin, warrants each new machine against defects in material and workmanship under normal use and service for a period of six (6) months. This warranty commences the first day the machine is sold, assigned to a rental fleet, or otherwise put to first use.
2. The obligation under this warranty is limited to the replacement or repair of parts and/or machine at MBW INC factory branches or at authorized MBW INC Distributors.
3. Machines altered or modified without MBW INC written consent voids this warranty. Misuse, negligence, accidents or the operation of machines in any way other than recommended by MBW INC will void this warranty. This warranty shall not apply to machines repaired by other than MBW INC factory branches or authorized MBW INC Distributors.
4. This warranty includes labor on all MBW INC products. Labor must be performed at an authorized MBW INC Distributor.
5. The cost of transportation and other expenses connected therewith are not covered by this warranty.
6. Written authorization for the return of merchandise under warranty must be obtained from MBW INC, Slinger, Wisconsin. In England: MBW (UK) LIMITED, Bradley Fold Trading Estate Unit 6, Radcliffe Moor Road, Bolton BL2 6RT.
7. MBW INC reserves the right to inspect and render final decision on each warranty case.
8. MBW INC reserves the right to improve or make product changes without incurring any obligation to update, refit, or install the same on machines previously sold.
9. MBW INC is not responsible for any liability or damage or injury directly or indirectly from design, material or operation of its products.
10. Warranty card must be returned to MBW INC, P.O. Box 440, Slinger, Wisconsin 53086—0440, within 10 days after purchase, assignment to a rental fleet, or first use. In England: MBW (UK) LIMITED, Bradley Fold Trading Estate Unit 6, Radcliffe Moor Road, Bolton BL2 6RT. Failure to return warranty card as specified renders the warranty null and void.
11. Requests for warranty must be submitted in writing within 30 days after machine failure to MBW INC, P.O. Box 440, Slinger, Wisconsin 53086—0440. In England: MBW (UK) LIMITED, Bradley Fold Trading Estate Unit 6, Radcliffe Moor Road, Bolton BL2 6RT.
12. THE FOREGOING WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE, AND OF ALL OTHER OBLIGATION OR LIABILITIES ON OUR PART, AND WE NEITHER ASSUME NOR AUTHORIZE ANY OTHER PERSON TO ASSUME FOR US ANY OTHER LIABILITY OR WARRANTY IN CONNECTION WITH THE SALE OR SERVICE OF ANY OF OUR PRODUCTS. LIKEWISE, THIS WARRANTY SHALL NOT APPLY WITH RESPECT TO ENGINES, MOTORS AND OTHER COMPONENT PARTS PRODUCED BY OTHER MANUFACTURERS AND USED ON MBW PRODUCTS, BUT SUCH ITEMS SHALL HAVE SUCH WARRANTIES AS MAY BE PROVIDED BY THE MANUFACTURER THEREOF.

MBW INC.

250 HARTFORD ROAD ● P.O. BOX 440
SLINGER, WI 53086—0440
PHONE: (262) 644—5234 ● FAX (262) 644—5169

MBW CORPORATE INTERNET ADDRESS
E—MAIL: mbw@mbw.com WEB SITE: www.mbw.com

IN ENGLAND:
MBW (UK) LIMITED
Bradley Fold Trading Estate Unit 6
Radcliffe Moor Road
Bolton BL2 6RT
Phone: 01204 387784 ● FAX: 01204 387797

MBW WAREHOUSE LOCATIONS

MBW *is at your service*

MBW Inc. has established a network of reputable Distributors with trained mechanics and full facilities for maintenance and rebuilding, and to carry an adequate parts stock in all areas of the country. Their sales engineers are available for professional consultation. If you cannot locate an MBW Inc. Distributor in your area, contact one of our Sales Branches or MBW Inc. The locations and phone numbers of the Sales Branches are listed below.

Remember — you own the best. If repairs are needed use only MBW Inc. parts purchased from Authorized MBW Inc. Distributors.

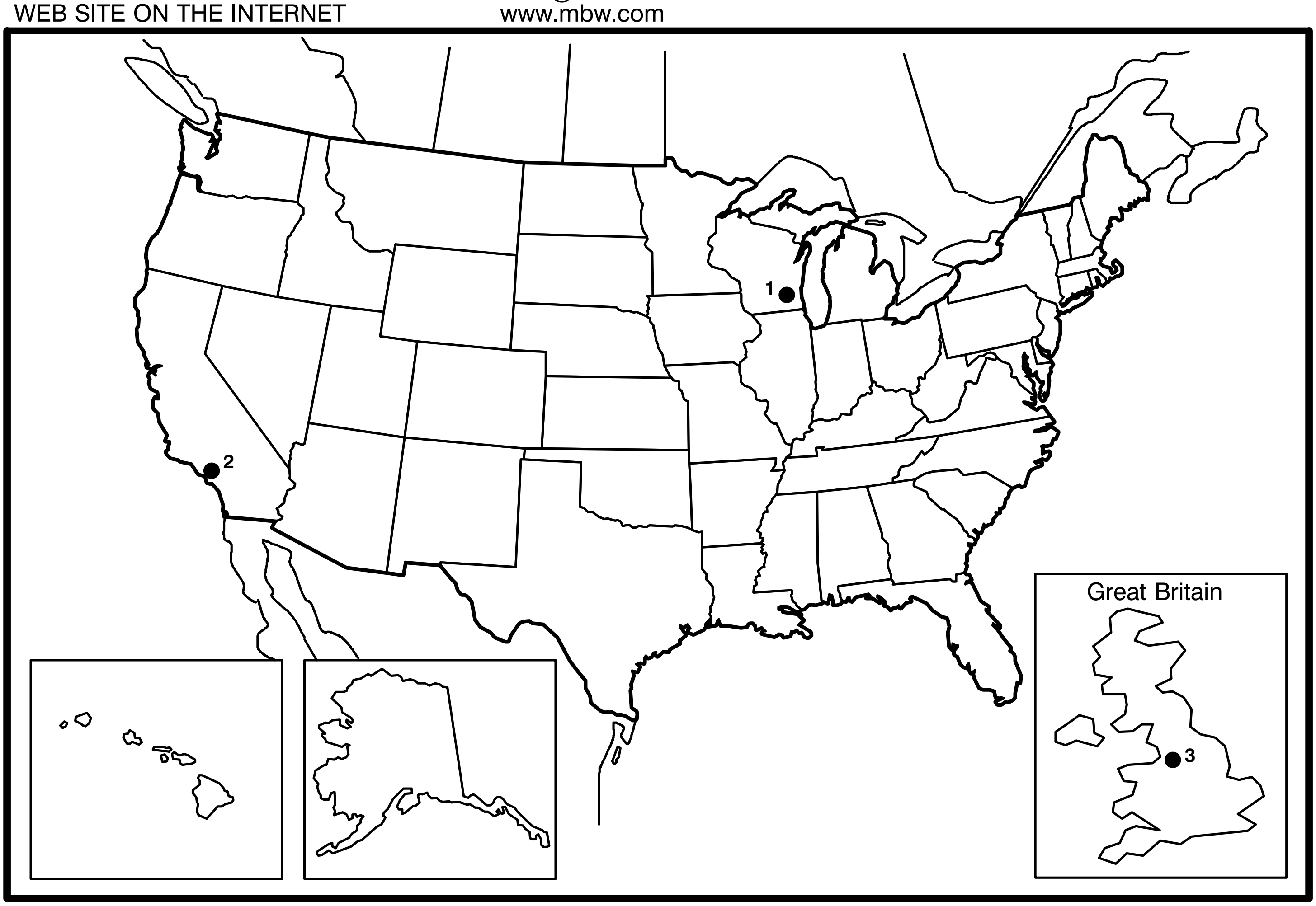
Sales Branches:

1. MBW Inc.
250 Hartford Rd.
P.O. Box 440
Slinger, WI 53086-0440
Phone: (262) 644-5234
FAX: (262) 644−5169

2. MBW Inc.
2341 Pomona Rincon Rd.
Suite 106
Corona, CA 92880
Phone: (714) 272-9989
FAX: (714) 272−9611

3. MBW (UK) LIMITED
Bradley Fold Trading Estate Unit 6
Radcliffe Moor Rd.
Bolton BL2 6RT
Phone: 01204 387784
FAX: 01204 387797

E−MAIL ON THE WORLD WIDE WEB mbw@mbw.com
WEB SITE ON THE INTERNET www.mbw.com



SPECIFICATIONS






R270R **R270ROI** **R376R** **R451R**

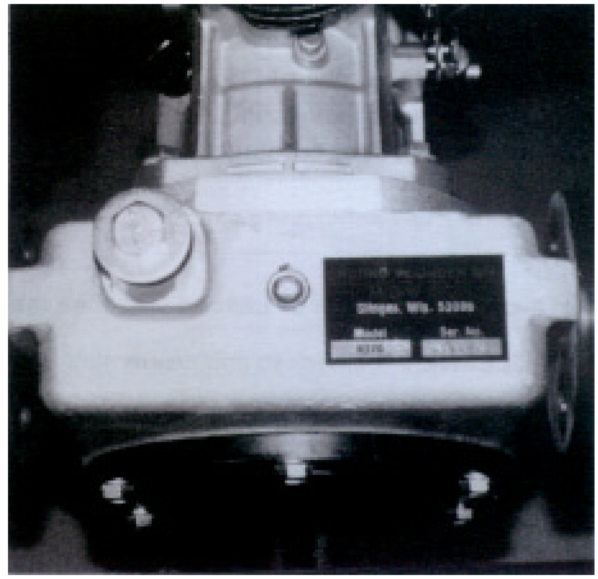
GASOLINE POWERED RAMMERS: Robin EC10D, and Robin EC12, 4 hp (3kW)

	UNITS	R270R	R270ROI	R374R	R376R	R450R	R451R
Operating Weight	lbs (kg)	142 (64)	160 (73)	155 (70)	158 (72)	142 (64)	148 (67)
Height	in (cm)	45 (114)	45 (114)	45-52 (114-132)	45-52 (114-132)	45 (114)	45 (114)
Width	in (cm)	17 (43)	17 (43)	17 (43)	17 (43)	17 (43)	17 (43)
Length	in (cm)	25.5 (65)	25.5 (65)	25.5 (65)	25.5 (65)	25.5 (65)	25.5 (65)
Shoe (W X L)	in (cm)	11 x 13 (28 x 33)	11 x 13 (28 x 33)	4 x 18 (10 x 46)	6 x 18 (15 x 46)	11 x 13 (28 x 33)	13 x 15 (33 x 38)
Compaction Force	lbf (kN)/blow	3400 (15.1)	3400 (15.1)	4000 (17.8)	4050 (18)	4500 (20)	4550 (20.3)
Percussion Rate	blows/minute	600-650	600-650	550–600	550–600	600-650	600-650
Travel Speed	ft/min (m/min)	55 (16.8)	55 (16.8)	50 (15.3)	50 (15.3)	60 (18.3)	60 (18.3)
Compaction Depth	in (cm)	22 (56)	22 (56)	24 (61)	23 (58)	24 (61)	24 (61)
Compaction Area	sqft/h (sqm/h)	3025 (280)	3025 (280)	1000 (93)	1500 (139)	3300 (307)	3900 (362)
Engine Speed	rpm	4300	4400	4000	4000	4400	4400
Fuel Capacity	qts (L)	2.5 (2.4)	2.5 (2.4)	2.5 (2.4)	2.5 (2.4)	2.5 (2.4)	2.5 (2.4)
Oil Tank Capacity	pints (L)	N/A	1 (.47)	N/A	N/A	N/A	N/A
PNEUMATIC POWERED RAMMERS: TCS 66V, 4hp (3kW)							
Operating Weight	lbs (kg)	125 (57)	N/A	N/A	N/A	125 (57)	130 (59)
Percussion Rate	blows/minute	650	N/A	N/A	N/A	650	650
Travel Speed	ft/min (m/min)	60 (18.3)	N/A	N/A	N/A	60 (18.3)	60 (18.3)
Compaction Area	sqft/h (sqm/h)	3300 (307)	N/A	N/A	N/A	3300 (307)	3900 (362)
Air Requirement	cfm / psi	75 / 110	N/A	N/A	N/A	75 / 110	75 / 110
Operating Speed	rpm	4500	N/A	N/A	N/A	4500	4500

SERIAL NUMBER LOCATION

RAMMER SERIAL NUMBER

1. Located on the top of the gearbox on the side next to the filler plug.



(Write Serial Number in box.)

2. The serial number is also stamped on the top of the gearbox in front of the breather boss.

PARTS ORDERING PROCEDURE

The **Warranty** is stated in this book on **page 4**. **Failure to return Warranty Registration Card renders the Warranty null and void.**

An Operating Instructions and Parts Catalog for the engine is also furnished. Engine Parts may be ordered from any authorized dealer. Refer to the Engine Operating Instructions and Parts Catalog for exploded view and parts identifications.

PARTS ORDERING:

MBW Inc. parts are available worldwide and must be ordered through your local **MBW Inc. Distributor**. If you cannot locate an **MBW Inc. Distributor** in your area, refer to page 5 of this Manual, locate the **MBW Inc.** Sales Branch nearest you and call for assistance.

ALWAYS INCLUDE:

1. Model and Serial Number of Machine when ordering **MBW Parts**.
2. Engine Model and Serial Number when ordering Engine Components.
3. Item Part Number, Description and Quantity.
4. Company Name, Address, Zip Code, and Purchase Order Number.
5. Preferred method of shipping.

REMEMBER — you own the best. If repairs are needed use only MBW Inc. parts purchased from Authorized MBW Inc. Distributors.

PRE—OPERATING INSTRUCTIONS

GASOLINE POWERED RAMMERS WITH ROBIN EC10 ENGINES ONLY:

- **FUEL SUPPLY —** The gasoline powered engines on MBW Inc rammers use an **oil-gasoline mixture**. For a break in period of 8 hours, use a 20:1 gasoline to oil mixture. After break-in, use a 50:1 mixture. To obtain a 50:1 mixture, thoroughly mix 3/4 pt (355 ml) of a good grade of 2-cycle oil with 5 gal (19 L) of clean, fresh, Unleaded gasoline in a clean, separate container.

NOTE: After break-in operation, engine exhaust should be clean (NO SMOKE).

Use of 4-cycle Motor Oils or Leaded Gasoline may cause varnishing or spark plug fouling.

- **AIR CLEANER —** Check to ensure element is in good condition and properly installed.
- **OIL LEVEL —** Check the Governor Chamber oil level by removing the Dip Stick. The oil mark should be about 5/16 in (8 mm) from the bottom of the Dip Stick. Add oil if required. For more information see **"Lubrication"** under **"PERIODIC MAINTENANCE,"** or the Robin EC10D Manual **"INSTRUCTIONS FOR USE"**.
- **FUEL FILTER —** If clogged or damaged, replace.

GASOLINE POWERED RAMMERS WITH ROBIN EC12 ENGINES ONLY:

- **FUEL SUPPLY —** The oil injected engines on gasoline powered MBW Inc rammers use an **unleaded gasoline mixture of 32:1 for a break in period.** After running the machine for a time, check to see if the engine is consuming 2-cycle oil from the oil tank. If the engine is consuming oil from the tank, you can use just unleaded gasoline in the fuel tank.

NOTE: After break-in operation, engine exhaust should be clean (NO SMOKE).

Use of 4-cycle Motor Oils or Leaded Gasoline may cause varnishing or spark plug fouling.

- **AIR CLEANER —** Check to ensure element is in good condition and properly installed.
- **OIL LEVEL —** Check the level of 2-cycle oil in the oil tank before starting. If required, add a good grade of exclusive 2-cycle oil. For more information see **"Lubrication"** under **"PERIODIC MAINTENANCE,"** or the Robin EC12 Manual **"INSTRUCTIONS FOR USE."**
- **OIL SENSOR —** Check to ensure wire leads are connected. Make sure the mounting nut is tight. If sensor is damaged replace.
- **FUEL FILTER —** If clogged or damaged, replace.

Make sure hands, feet and clothing are at a safe distance from any moveable parts prior to starting, Also, before starting, review related Safety Precautions listed on Page 1.

PNEUMATIC POWERED RAMMERS:

- **GOVERNOR –** Do not disassemble the governor. The governor is guaranteed by the motor manufacturer for the life of the motor if it is not abused. Tampering with the governor voids this warranty and may result in serious injury or death.

- **LUBRICATION –** Oil lubrication must be supplied to the pneumatic motor at all times during operation. Operating the rammer without lubrication will cause premature wear and ultimately failure of the motor. Do not install a lubricator on the rammer handle. **Air lubrication system should supply 1/2 oz oil for every 8 hours of use.**

- **COMPRESSED AIR SUPPLY –** All MBW AIRAMMERS require a compressed air supply of at least 85 cfm (cubic feet per minute) at 110 psi (pounds per square inch). The air supply must be provided on a continuous basis. (i.e. Check the compressor pressure gauge while the rammer is running). Peak compaction performance will not be achieved if the air supply is inadequate.

- **MOTOR ICING –** If the rammer is operated for extended periods of time or is operated in high humidity conditions, frost will form on the motor. This is normal and will not harm the motor. If the motor should "freeze up" from icing, allow it to thaw before continuing usage. Ensure that there is adequate oil supply to the motor.

Make sure hands, feet and clothing are at a safe distance from any moveable parts prior to starting, Also, before starting, review related Safety Precautions listed on Page 1.

OPERATING INSTRUCTIONS

GASOLINE POWERED MODELS:

STARTING

For detailed instructions refer to EC10D or EC12 (oil injected) Engine Manual.

1. Open fuel valve.
2. Choke engine. When starting a warm engine, choke may not be required.
3. Place thottle at idle position.
4. If engine is equipped with a switch, turn to the “ON” position.
5. Pull starter rope.
6. After the engine starts, open the choke. Let engine warm up in the idle position for approximately one minute.

If the engine does not start after five or six pulls, check the spark plug for carbon deposits.

OPERATING

1. After the engine warms up, open the throttle. For normal operation, open the throttle fully.
2. On uneven areas, pushing down on the handle will aid climbing ability.

Do not bear down (Body Weight Of Operator) on the machine.

3. After three passes, the rammer may have more kick back. This is an indication that ideal compaction is being reached.

STOPPING

1. Whenever possible, allow the engine to idle before stopping.
2. Move the throttle to the idle position.
3. Press the stop button on the side of the blower housing, or turn the switch on the blower housing to “OFF”
4. Close fuel valve.

STOP THE ENGINE BEFORE:

- **Adding fuel or oil.**
- **Leaving equipment unattended, even if only for a minute.**
- **Making any repairs or adjustments.**

PNEUMATIC POWERED MODELS:

STARTING

1. Connect the air compressor supply hose to the airammer. **USE SAFETY CLIPS.**
2. Open the air supply hose valve on the compressor.
3. Squeeze the Airammer actuator handle.

OPERATING

1. Squeeze the Airammer actuator handle and check the Airammer pressure gage. If the needle is not in the green area check the compressor operation and make sure there are no kinks in the air hose.
2. On uneven areas, pushing down on the handle will aid climbing ability.

Do not bear down (Body Weight Of Operator) on the machine.

3. After three passes, the rammer may have more kick back. This is an indication that ideal compaction is being reached.

STOPPING

1. Release the Airammer actuator handle. Close the air supply valve on the compressor. Squeeze the Airammer actuator handle to depressurize the air supply hose before disconnecting the air hose.

STOP THE MOTOR BEFORE:

- **Leaving equipment unattended, even if only for a minute.**
- **Making any repairs or adjustments.**

PERIODIC MAINTENANCE

GASOLINE ENGINES:

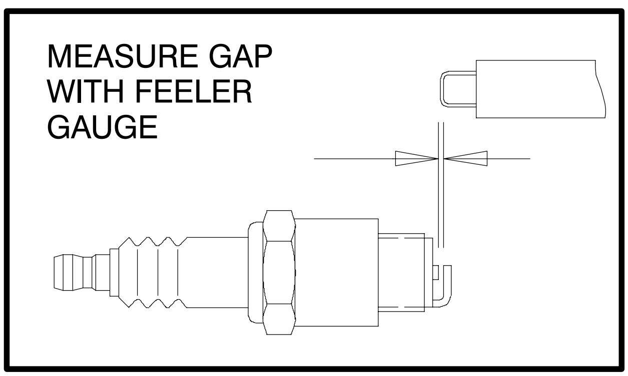
AIR CLEANER

The rammer uses a dry type air cleaner element. Clean the element by removing it and tapping it lightly on a flat surface. Keep tapping until no dust comes off. The element should be replaced if dust does not drop off easily or if element becomes damaged.

NOTE: Do not wash the element in any liquid or blow dust off with compressed air. Do not tap element on a sharp corner, it may damage the seal.

SPARK PLUG

Remove and check the spark plug regularly. Clean or replace if necessary. Set the spark plug gap according to the tune-up specifications section. Reinstall the plug and torque to 15-20 ft. lbs. (21-28 N●m).



ENGINE LUBRICATION: Robin EC10

1. The 2-cycle engine is lubricated by the oil-gasoline mixture. Use a 20:1 gas to oil mixture for a break-in period of 8 hours. After break-in, use a 50:1 gas to oil mixture. For a 50:1 mixture, mix 3/4 pint (12 ounces, 355 ml) of 2—cycle motor oil with 5 gallons (19L) of lead—free gasoline.

2. The Robin 2-cycle engine also has oil in a separate governor crankcase.
   a. Remove the governor chamber dipstick which is behind the muffler.
   b. The oil level should be at the upper level which is 0.31 in. (8mm) up from the bottom of the dip-stick.
   c. If oil is needed, add a good grade of **"Service SF" SAE 10W—30** Motor Oil.
   d. Also see the Robin **"Operating Instructions and Parts List"**.

ENGINE LUBRICATION: Robin EC12 oil injected

1. The EC12 two-cycle engine is lubricated by the two-cycle oil from a separate oil tank. Use a 32:1 gas to oil mixture for a break-in period of 8 hours. After break-in, use only unleaded gasoline in the fuel tank provided the engine is consuming oil from the oil tank.
2. The oil tank is equipped with a filtering screen built into the elbow on the bottom of the tank. This should be replaced once a year or 300 hours, whichever comes first. At this time, drain oil in tank and test oil sensor. To do this, use a spark tester and pull on the starter rope. If you get a spark, the oil sensor is no good, replace.

MUFFLER

Check and clean the muffler exhaust hole regularly but **do not enlarge it**.

NOTE: If the muffler exhaust hole is enlarged or holes are drilled into the muffler the warranty is voided.

TUNE-UP SPECIFICATIONS FOR ROBIN EC10

1. Spark Plug Gap
   Robin NGK B-4HS—0.024—0.028in (0.6—0.7mm)
   Champion UJ12—0.024—0.028in (0.6—0.7 mm)
2. Ignition Coil Air Gap
   Robin engine points: 0.012—0.020in (0.3—0.5mm)
3. Carburetor
   Low speed adjusting screw, approximately one turn counterclockwise.

TUNE-UP SPECIFICATIONS FOR ROBIN EC12

1. Spark Plug Gap
   Robin NGK BM6A—0.024—0.028in. (0.6—0.7mm)
   Champion CJ8—0.024—0.028in. (0.6—0.7mm)
2. Ignition Coil Air Gap
   Robin engine points: 0.012—0.020in (0.3—0.5 mm)
3. Carburetor
   Low speed adjusting screw, approximately one turn counterclockwise.

TORQUE SPECIFICATIONS

SPARK PLUG	15—20 ft lbs (21—28 N●m)
FLYWHEEL	35 ft lbs (49 N●m)
OIL DRAIN PLUG	10 ft lbs (14 N●m)
OIL FILLER PLUG	10 ft lbs (14 N●m)

PNEUMATIC MOTORS:

GOVERNOR

Do not disassemble the governor. The governor is guaranteed by the motor manufacturer for the life of the motor if it is not abused. Tampering with the governor **voids** this warranty and may **result in serious injury or death.** To remove the governor use the governor wrench available from MBW or from an authorized TCS dealer.

MOTOR LUBRICATION

Oil lubrication must be supplied to the pneumatic motor at all times during operation. Operating the rammer without lubrication will cause premature wear and ultimately failure of the motor.

1. If the air supply hose from the compressor to the rammer is less than 50' long, the oiler on the compressor should be sufficient.
2. If the air supply hose is longer than 50', an additional oiler must be provided near the rammer.
3. A high volume flow in line oiler is adequate. Do not install a lubricator on the rammer handle.
4. Use a suitable air tool approved oil such as Exxon Spinesstic 10, Atlantic Richfield Duro 55, Gulf Gulfspin 10 or equivalent.

COMPRESSED AIR SUPPLY

MBW AIRAMMERS require an adequate compressed air supply. The air supply must be provided on a continuous basis. (i.e. Check the compressor pressure gauge while the rammer is running).

R270A, R450A, R451A: require at least 75 cfm (cubic feet per minute) at 110 psi (pounds per square inch).

MOTOR ICING

If the rammer is operated for extended periods of time or is operated in high humidity conditions, frost will form on the motor. This is normal and will not harm the motor. If the motor should "freeze up" from icing, allow it to thaw before continuing usage. Ensure that there is adequate oil supply to the motor.

PERCUSSION SYSTEM (GASOLINE & PNEUMATIC UNITS):

LUBRICATION

The rammer percussion system and gear box are lubricated by an oil mist which is formed and carried throughout the rammer by a pumping action in the machine's lower system.

1. Before daily operation, place the rammer on a flat surface and check the oil level in the glass sight gauge on the lower mount.
2. If the oil is not visible in the sight gauge, add oil as required. Use a good grade of **"Service SF" SAE 10W—30** motor Oil.
3. Change the oil in the rammer after the first 50 hours of operation and every 300 hours thereafter.
4. The oil can be drained by removing the drain plug in the lower bellow mount. After the oil has drained out, reinstall the drain plug and remove the filler plug located on top of the gear box. Fill with 12 oz (360 ml) of **"Service SF" SAE 10W—30** Motor Oil. Replace the filler plug.

TORQUE SPECIFICATIONS

OIL DRAIN PLUG	10 ft lbs (14 N•m)
OIL FILLER PLUG	10 ft lbs (14 N•m)

DISASSEMBLY

GENERAL

The disassembly and assembly procedures given on the next few pages are intended for a complete dismantling of the various Rammer models. Read the following sections carefully and refer to the appropriate sections for the rammer being repaired. It is not necessary to follow the complete disassembly procedure when only partial disassembly is required. If repairs have to be made to the Lower System only, it is recommended that the Drive Unit (Engine, Gearbox and Handle) be removed from the Lower System. See "Lower System" disassembly.

HANDLE REMOVAL:

GASOLINE RAMMERS:

1. Turn off the Fuel Valve (Fig 11, #8).
2. Loosen Hose Clamp (Fig 11, #22) and disconnect the Fuel Line from the Carburetor.
3. Remove the hardware holding the Throttle (Fig 11, #15,#16 & #19) to the Handle.
4. Remove four (4) Flange Whiz Lock Screws (Fig 11, #2) and lift the Handle free from the Rammer.

PNEUMATIC RAMMERS:

1. Disconnect the compressed air supply hose at the rammer handle valve block.

Ensure that air supply hoses have been depressurized before disconnecting.

2. Disconnect the air hose at the pneumatic motor.
3. Remove four (4) Socket Head Cap Screws (Fig 7, #23) and lift the Handle free from the Rammer.

MOTOR REMOVAL:

It is not necessary to remove the Handle to take the Engine off the machine.

GASOLINE ENGINE :

1. Remove the two (2) Flange Whiz-Lock Screws (Fig 17, #10). Remove the four (4) Hex Head Cap Screws and Lockwashers (Fig 17, #4 & #3) holding the Engine (Fig 17, #1) and Spacer (Fig 17, #2) to the Gearbox.
2. The Engine and Spacer can now be removed from the machine.

PNEUMATIC MOTOR (TCS):

1. Remove the four (4) Hex Head Cap Screws and Lockwashers (Fig 20, #6 & #5) holding the Motor (Fig 20, #7) to the Gearbox.
2. The Motor can now be removed from the machine.

CENTRIFUGAL CLUTCH:

1. The Clutch (Fig 17, #7) can be removed from the Engine by using the **MBW Clutch Removal Tool #07353**.
2. Reinstall the Clutch to the Engine P.T.O. Shaft finger tight.

GEARBOX REMOVAL:

Remove the handle and the motor as previously instructed.

R270, R450, R451:

1. Remove the Socket Head Cap Screws and Lockwashers (Fig 7, #29 & #28) holding the Gearbox to the Lower System.
2. Push the Guide Tube (Fig 9, #3) down until it exposes the Ram Head and Piston Pin (Fig 7, #27). While holding the Gearbox, tap out the Piston Pin with a hammer and drift pin. The Gearbox may now be removed from the Lower System. See Figure 1.

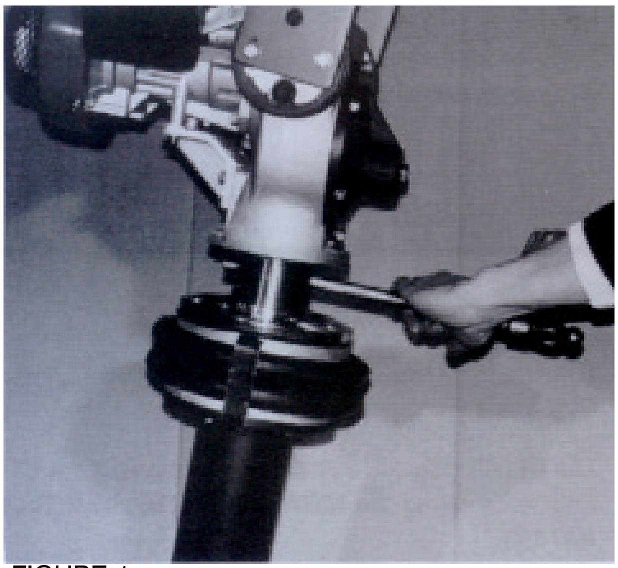


FIGURE 1

R374, R376:

1. Remove the Socket Head Cap Screws (Fig 8, #40) from the top of the Guide Tube flange.
2. Push the Bellows and Rubber Gasket down until the Flat Head Socket Screws are exposed (Fig 8, #29). Remove the flat head socket screws and Conical Lockwashers (Fig 8, #29 & #28). The conical washers may not be reused. New conical washers must be used upon assembly.
3. Push the Guide Tube (Fig 10, #3) down until it exposes the Ram Head and Piston Pin (Fig 7, #27). While holding the Gearbox, tap out the Piston Pin with a hammer and drift pin. The Gearbox may now be removed from the Lower System. See Figure 2.

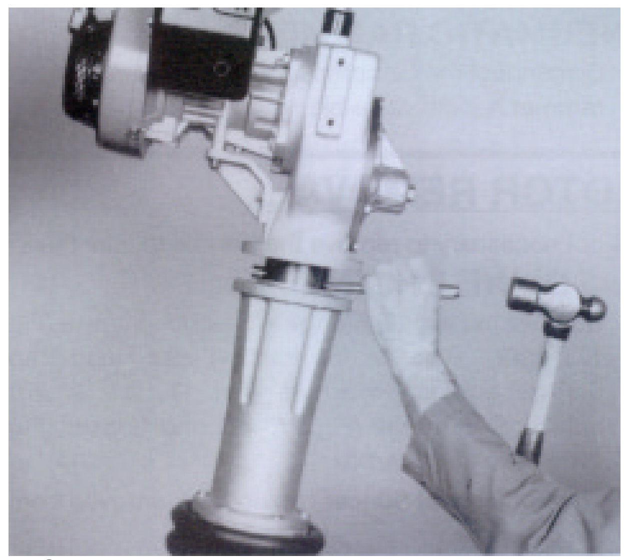


FIGURE 2

GEARBOX DISASSEMBLY:

All item numbers on this page refer to Figure 7, unless otherwise specified. The R270, R374, R376, R450 and R451 rammers use a common gearbox which is referred to as the 270 gearbox in this section. Remove the gearbox as previously instructed.

COVER REMOVAL:

1. Remove the six (6) Flange Whiz Lock Screws (#16).
2. Install two (2) of the screws into the two threaded holes in the cover (protected by the Caplugs) and turn them in equally to back out the cover. If the cover should cock, a pry bar may be used to bring the cover off straight. See Figure 3.

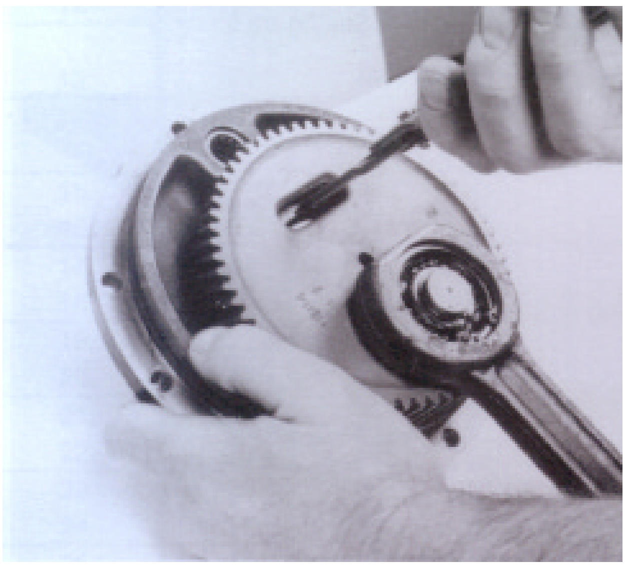


FIGURE 3

3. Remove and replace O-Ring or Gasket. (#15)

PINION REMOVAL:

1. Remove Retaining Ring (#8) from front cover side of gearbox. If the retaining ring is pinched in its groove, tap the pinion on the drum side. This will relieve the pressure on the retaining ring.
2. Press out Pinion (#21).
3. Pry out Seal (#20) and replace.
4. Remove Retaining Ring (#9).
5. Press out Bearing (#7).

CRANK GEAR REMOVAL:

1. Slip a retaining ring pliers through the slot opening in the Crank Gear (#6) and remove the Retaining Ring (#9). See Figure 4.

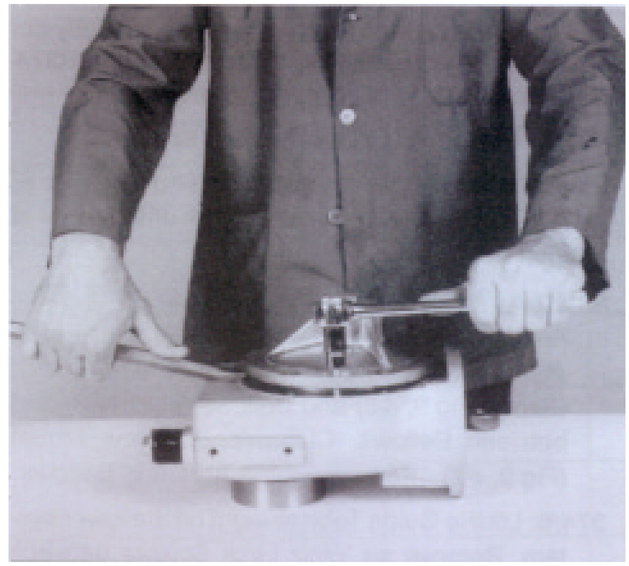


FIGURE 4

2. Remove the Hex Head Cap Screw (#18) and Seal Washer (#17) from front cover.
3. Use a 3/8 in (10mm) dia. steel rod to press crank gear out of the cover.
4. Remove the small Retaining Ring (#14).
5. Remove the Connecting Rod (#10) from the crank gear.
6. Use a bearing puller to remove the bearing (#7) from the crank gear.
7. Remove the small Needle Bearing (#3) and the large Needle Bearing (#5) with a blind hole bearing puller.

BREATHER REMOVAL

1. Remove the Hex Head Cap Screw (#37) from the top of the Breather Assembly (#38).
2. Pull off the Plain Washer (#36), Cap (#35) and Filter (#34).
3. Use a pipe wrench to remove the Breather Tube (#30). **Do not disassemble the breather sub—assembly.**

LOWER SYSTEM:

The lower system can be separated from the drive unit (engine, gearbox and handle) without going through the complete disassembly procedure. If the lower system has not already been separated, follow the appropriate “Gearbox Removal” instructions.

The R270, R450 and R451 rammers use a similarly constructed lower system which is reffered to as the 270 lower system. The 270 lower system differs from the R374 and R376 lower system, however, due to common design features, the disassembly procedure is similar.

GUIDE TUBE AND BELLOWS:

1. Drain the oil by removing the Drain Plug (Fig 9, #23). Tilt the Lower System back until the oil is drained out.
2. Remove the Guide Tube and Bellows:

   Remove twelve bolts and lockwashers (Fig 9, #31 & #30) between Guide Tube (Fig 9, #3), Clamp (Fig 9, #5) and Bellows (Fig 9, #6) and between Bellows, Clamp and Bellow Mount (Fig 9, #7). Remove Guide Tube and Bellows.

   374/6: Lift the Guide Tube straight off the lower system. Remove six Whiz Lock Screws between the Spring Box (Fig 10, #12), Clamp (Fig 10, #5) and Bellows (Fig 10, #6). Remove Bellows.
3. Remove Slide Bearings (Fig 9, #1) from Guide Tube. Remove Retaining Ring (Fig 9, #29). Carefully drive bearings out from the opposite end of guide tube. Do not scratch or gouge guide tube walls. Install new slide bearings and retaining ring.
4. Remove the Shoe:

   Remove the six Hex Nuts and Lockwashers (Fig 9, #27 & #26) and remove the Shoe (Fig 9, #25).

   374/6: Remove four Deformed Locknuts, Hex Nuts and Lockwashers (Fig 10, #29, #28 & #27) remove Shoe (Fig 10, #25).
5. Lift Bellow Mount (Fig 9, #7) off Spring Box (Fig 9, #12). Remove and replace bellow mount O-Ring (Fig 9, #8) (A separate bellow mount is not used on trench rammers.)

SPRING BOX:

CAUTION: <u>Observe</u> the WARNING LABEL (Fig 9, #24) on the Spring Box Cover (Fig 9, #20). Follow the next steps <u>VERY CAREFULLY.</u>

1. Flip Spring Box Assembly (Fig 9, #12) upside down. Insert two (2) M-B-W spring box tools #06468 from the bottom of the spring box cover **(Tools should be 180° apart).**
2. Run the nuts that come with the tools down snug against the Cover (Fig 9, #20).
3. Remove the Flat Head Socket Screws (Fig 9, #21) holding the Cover to the Spring Box. The 270 spring box uses three flat head socket screws and the 374/6 uses two. See figure 5.

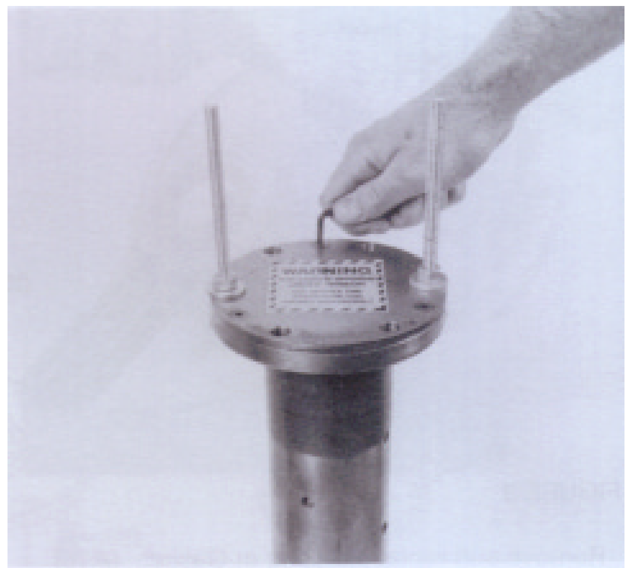


FIGURE 5

4. While preventing the bottom of the tool from turning, **slowly and evenly** back off the nuts on the cover side. After the tension is removed from the cover, the tools and the cover can be removed.
5. Remove and replace the O-Ring (Fig 9, #19) from the Cover (Fig 9, #20).
4. Remove the lower Springs (Fig 9, #13 & #14) from the spring box.
5. Remove and discard the Elastic Nut (Fig 9, #18). To remove the nut, place a drift pin or steel rod through the piston pin hole in the Ram Head (Fig 9, #9) to prevent the ram head from turning while removing the nut.
6. Remove the Washers (Fig 9, #15), Piston (Fig 9, #17), Spacer (Fig 9, #16) and upper Springs (Fig 9, #13 & #14).

ASSEMBLY

The assembly of the Rammer is the reverse of the disassembly procedure with the addition of the following steps. Prior to assembly, wash all parts in a suitable cleaner or solvent. Check moving parts for wear and failure. Refer to the **REPLACEMENT CHART** for tolerances and replacement cycles. For torque settings other than those listed see **TORQUE CHART**.

GEARBOX ASSEMBLY:

1. Ensure that Bearings press on <u>square</u> and seat properly.
2. Be sure Retaining Ring (Fig 7, #9) is on the Crank Gear (Fig 7, #6) before the Bearing (Fig 7, #7) is pressed on.
3. While pressing the Pinion into the Gearbox, **<u>do not</u>** use excessive pressure to seat the Pinion.
4. Lightly oil the O-Ring (Fig 7 #15) before installing it into the Cover (Fig 7, #1).
5. Apply Loctite #242 to six Flange Whiz Lock Screws (Fig 7, #16) and install. Tighten equally and torque to 12 ft lbs (16 N●m).
6. If the Shockmounts (Fig 7, #22) were removed, apply Loctite #242 to the four Socket Head Cap Screws (Fig 7, #23) before assembly. Torque the four Socket Head Cap Screws to 35 ft lbs (47 N●m).
7. Replace Seal Washer (Fig 7, #17) if damaged. **Do not** over tighten Hex Head Cap Screw (Fig 7, #18).
8. Use Loctite #242 on the Breather Tube Assembly (Fig 7, #30). Torque to 50 ft lbs (68 N●m).
9. Before installing the Gearbox to the Lower System, install a new Gasket (Fig 7, #26) on the top of the Lower System.
10. Torque the four Socket Head Cap Screws (Fig 7, #29) holding the Gearbox to the Lower System to 60 ft lbs (81 N●m).

LOWER SYSTEM ASSEMBLY:

1. The Elastic Stop Nut (Fig 9, #18) must be replaced and torqued to 100 ft lbs (135 N●m).
2. Lightly grease the O-Ring groove in the Cover (Fig 9, #20) before installing the O-Ring (Fig 9, #19). Use the two Spring Box Tools to draw the Cover down onto the Spring Box.
3. Install three Flat Head Socket Screws (Fig 9, #21) and torque to 8 ft lbs (11 N●m).
4. Before sliding Mount (Fig 9, #7) on to Spring Box, lightly oil O-Ring (Fig 9, #8) and place it into the groove in the Mount.
5. Torque the six (6) Hex Nuts (Fig 9, #27) holding the Shoe to the Spring Box to 50 ft lbs (67 N●m).

The spring box WARNING DECAL (Fig 9, #24) should be clean and highly visible. If it is not, the old decal should be completely removed and replaced.

HANDLE (AIRAMMER):

1. Slide Valve Block (Fig 16, #18) back and forth on Handle (Fig 16, #1) as required before tightening Clamps (Fig 16, #4) to ensure that the Actuator Arm (Fig 16, #5) does not bind.
2. Adjust Set Screw (Fig 6, #17) as required to ensure that: (see Figure 6)
   a. When Actuator Arm (Fig 6, #5) is released, valve is completely closed.
   b. When Actuator Arm (Fig 6, #5) is raised, valve is fully opened and no air is exhausted from the lower vent hole.

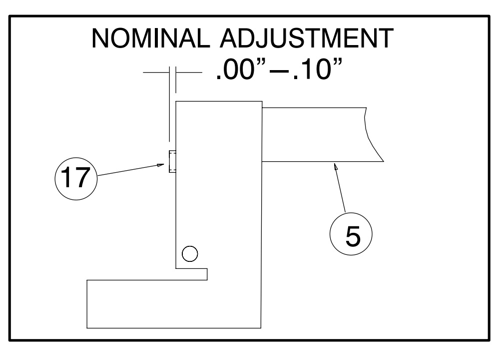


FIGURE 6

KITS & TORQUE CHART

MBW TOOLS & KITS

01629	Test Mat, rubber
06159	Shoe, Rammer Cast Iron
02424	Kit, 6” Extension R274/R276
07986	Shoe, 11” Aluminum R274/R276
07960	Shoe, 6” Trench Rammer
07956	Shoe, 4” Trench Rammer
02435	Handle, Lo—profile R270R
12101	Kit, Decal R270R
02324	Flywheel Puller, Fuji Robin EC10D
12862	Handle, Lo-profile R270R
14864	Handle, Lo-profile 270ROI
02441	Kit, Diaphragm Carburetor Robin EC10D
02530	Kit, R270 Truck Transporter
03146	Kit, Job Cart 270, 374, 376, 450
03180	Kit, Job Cart 451
05968	Kit, Caplug 12 pieces
06468	Kit, Spring Box Tool
06472	Kit, O—Ring and Oil Seal
07205	Kit, Bellow Installation Tool
07235	Kit, R270 Shoe Extension 4” x 12”
07240	Kit, R270 Shoe Extension 6” x 12”
07353	Clutch Removal Tool (#07515 cast hub clutch)
07552	Kit, Bearing Puller
07575	Kit, R270 Robin Air Cleaner (EC10)
07694	Kit, R270 Shoe Width Extension 14”
07745	Kit, Breakerless Ignition Robin EC10D
07747	Kit, Robin EC10D TCI unit Replacement
07790	Kit, R270C 14” Wide Handle
12230	Kit, Governor Wrench TCS Motor
12247	Kit, Swivel Airammer
12248	Kit, Filter—Lubricator Airammer

TORQUE CHART

TIGHTENING TORQUE

(In cast iron or steel.)

SIZE	GRADE 2	GRADE 5
10-24	32 in lb	40 in lb
10-32	32 in lb	32 in lb
1/4-20	70 in lb	115 in lb
1/4-28	85 in lb	140 in lb
5/16-18	150 in lb	250 in lb
5/16-24	165 in lb	270 in lb
3/8-16	260 in lb	35 ft lb
3/8-24	300 in lb	40 ft lb
7/16-14	35 ft lb	55 ft lb
7/16-20	45 ft lb	75 ft lb
1/2-13	50 ft lb	80 ft lb
1/2-20	70 ft lb	105 ft lb

(For tightening torque in aluminum, use grade 2 column above.)

CONVERSIONS

in lbs x 0.083 = ft lbs
ft lbs x 12 = in lbs
ft lbs x 0.1383 = kg m
ft lbs x 1.3558 = N m

REMEMBER — YOU OWN THE BEST! If repairs are needed use only MBW Inc. parts purchased from Authorized MBW Inc. Distributors.

REPLACEMENT AND TOLERANCE CHART

Part	TOLERANCE OR REPLACEMENT CYCLE
Air Cleaner Element	**Clean Element Daily,** more often under dusty conditions. Tap Element lightly on a flat surface — If dust does not drop off easily or if element is bent or crushed .... Replace It!
Bearing (Bronze)	If there are wear marks or the I.D. is greater than 1.145 in (29mm), replace.
Bearings	**Replace anytime** a Bearing is rough, binding or discolored.
Bellows	When the Bellows are worn or cracked to the point of leaking, replace the Bellows. A leak may occur from a loose Clamp. If this is the case, tighten the Clamp.
Bushing (Piston Pin)	Replace if it is discolored or the I.D. is greater than 0.630in (16mm).
Clutch	Replace the Shoes and Spring if they show signs of heat damage or the Clutch **does not disengage** below 2000 rpm.
Crank Gear	Replace if the teeth are cracked or they become sharp.
Governor Chamber Oil (Robin EC10D)	Replace after first 100 hours, thereafter, every 300 hours or 1 year. Use 1 ounce (30 ml) of **"Service SF" SAE 10W—30** Motor Oil.
Guide Bushings	If a 0.025in (0.635mm) feeler gage can be slid between the Spring Box and Guide Tube replace the Bushings.
Hardware	Torque all bolts after the first eight hours of operation and **check every 25 hours.**
O-Rings and Seals	**Replace at every overhaul or teardown**. Use M-B-W O-Ring and Seal Kit #06472.
Oil Screen (Robin EC12D)	Clean or Replace Oil Screen, every 300 hours or 1 year.
Oil Line (Robin EC12D)	Replace Oil Line every year.
Pinion	Replace if teeth are chipped or they become sharp. Also replace if drum is scored or gouged deeper than 0.03in (0.76mm).
Piston	If a 0.025in (0.635mm) feeler gage can be slid between the Piston and Spring Box replace the Piston.
Piston Pin	If the outside diameter is less than 0.620in (15.75mm), replace.
Piston Washers	**Replace** if Washers are dished.
Ram Shaft	If the outside diameter is less than 1.120in (28.4mm) replace.
Rammer Oil	Replace after the first 50 hours, then after every 300 hours or 1 year. Use 12 ounces (360ml) of **Service SF SAE 10W—30 Motor Oil**.
Safety Decals	**Replace** if they become damaged or illegible or if unit is repainted.
Springs	If a flat spot on the side of a spring is greater than 0.09 in (2mm) or the free length is less than 6.75 in (171 mm), **replace all springs.**

REMEMBER — YOU OWN THE BEST! If repairs are needed use only MBW Inc. Parts purchased from Authorized MBW Distributors.

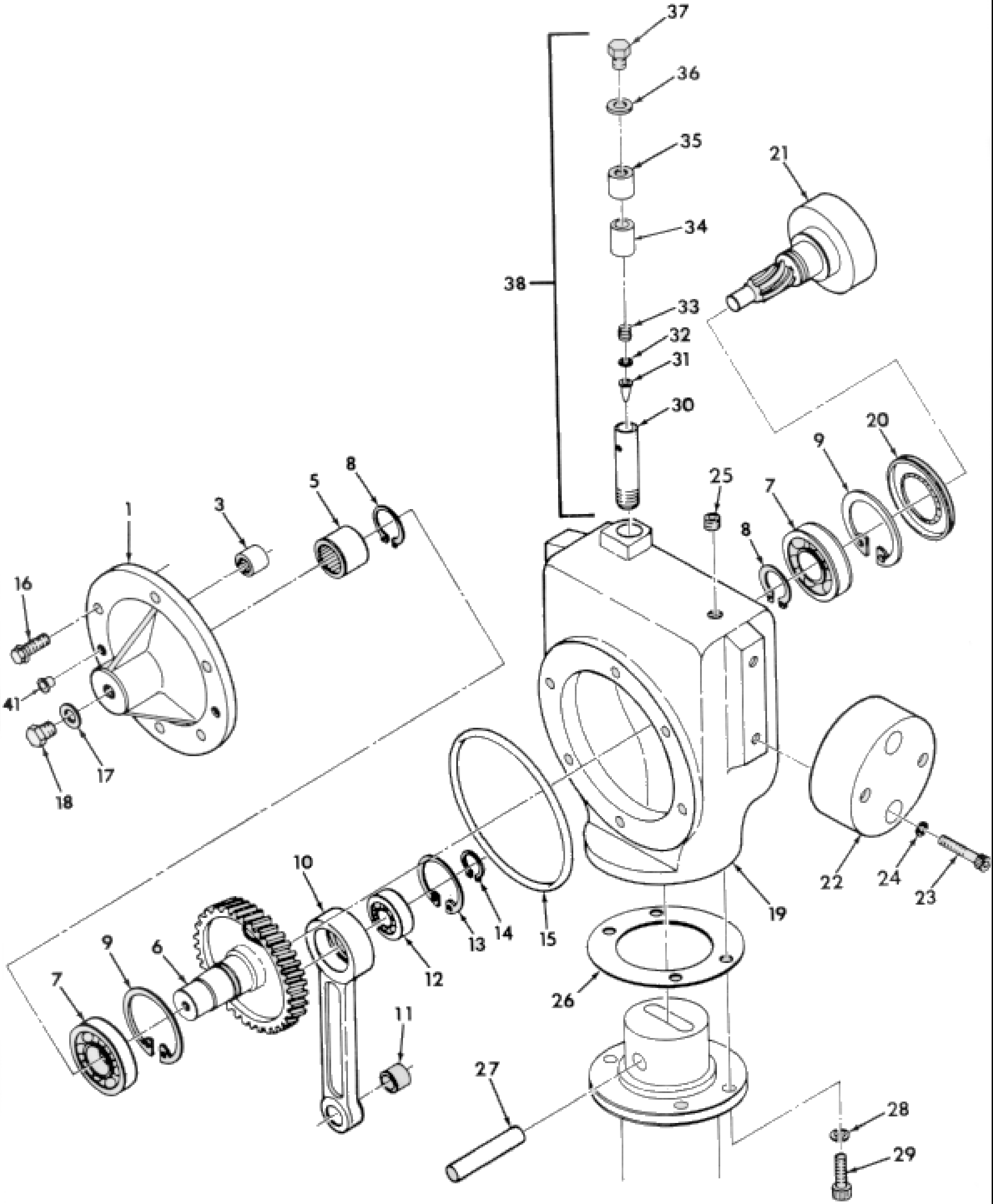


FIGURE 7: 270, 450 & 451 GEARBOX

270, 450 & 451 GEARBOX

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06167	COVER – S/N BELOW 2717321 (270) AND 4511899 (450/451)	1
1.	15768	COVER – S/N 2717321 & ABOVE (270), 4511899 & ABOVE (450/451)	1
2.			
3.	06260	BEARING, NEEDLE	1
4.			
5.	06259	BEARING, NEEDLE	1
6.	06240	GEAR	1
7.	01103	BEARING, RADIAL	2
8.	01001	RETAINING RING, EXTERNAL	2
9.	06266	RETAINING RING, INTERNAL	2
10.	06161	CONNECTING ROD ASSEMBLY (INCLUDES ITEM 11)	1
11.	06262	BUSHING	1
12.	01105	BEARING, RADIAL	1
13.	06264	RETAINING RING, INTERNAL	1
14.	06265	RETAINING RING, EXTERNAL	1
15.	06238	O–RING	1
16.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16–18 X 1	6
17.	06275	WASHER, SEAL	1
18.	F081305HCS	HEX HEAD CAP SCREW, 1/2–13 X 5/8	1
19.	06169	GEARBOX – S/N BELOW 2717321 (270) AND 4511899 (450/451)	1
19.	15872	GEARBOX – S/N 2717321 & ABOVE (270), 4511899 & ABOVE (450/451	1
20.	06274	SEAL, OIL	1
21.	06249	PINION	1
22.	07351	SHOCKMOUNT (R270 ONLY)	2
	11530	SHOCKMOUNT (R450–R451 ONLY)	2
	06302	SHOCKMOUNT (R270 PRIOR TO SERIAL #2700929, NOT SHOWN)	2
23.	F051810SCS	SOCKET HEAD CAP SCREW, 5/16–18 X 1–1/4	4
	F051818SCS	SOCKET HEAD CAP SCREW, 5/16–18 X 2–1/4 (USE WITH #06302)	4
24.			
25.	F0618SPP	SOCKET PIPE PLUG. 3/8 NPT	1
26.	06925	GASKET	1
27.	06304	PISTON PIN	1
28.	08504	LOCKWASHER 1/2” HIGH COLLAR	4
29.	F081312SCS	SOCKET HEAD CAP SCREW, 1/2–13 X 1–1/2	4
30.	06908	TUBE	1
31.	06413	VALVE	1
32.	F01PW	PLAINWASHER, #6 SAE	1
33.	06423	SPRING	1
34.	06905	FILTER, BREATHER	1
35.	06910	COVER	1
36.	F08SW	PLAINWASHER, 1/2	1
37.	F081304HCS	HEX HEAD CAP SCREW, 1/2–13 X 1/2	1
38.	06904	BREATHER SUB–ASSEMBLY (INCLUDES ITEMS 30–37)	1
39.	06172	GEARBOX ASSEMBLY (INCLUDES ALL ABOVE EXCEPT 22, 23, 26–29)	1
	06172R	GEARBOX ASSEMBLY, REBUILT	1
40.	07172	WASHER, HIGH COLLAR	4
41.	05968	CAPLUG, KIT OF 12	1

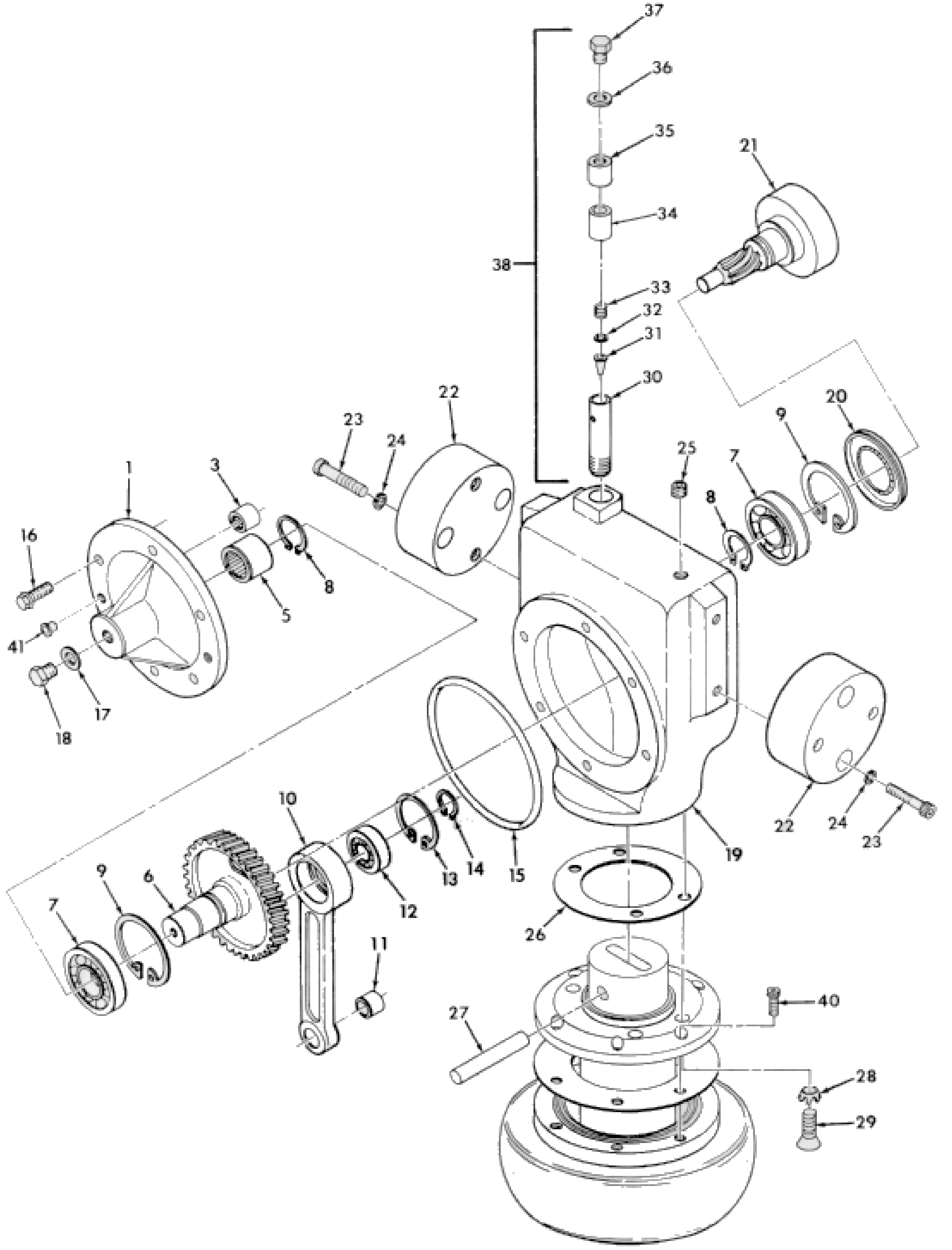


FIGURE 8: 374 & 376 GEARBOX

374 & 376 GEARBOX

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06167	COVER – S/N BELOW 3700440	1
1.	15768	COVER – S/N 3700440 & ABOVE	1
2.			
3.	06260	BEARING, NEEDLE	1
4.			
5.	06259	BEARING, NEEDLE	1
6.	06240	GEAR	1
7.	01103	BEARING, RADIAL	2
8.	01001	RETAINING RING, EXTERNAL	2
9.	06266	RETAINING RING, INTERNAL	2
10.	06161	CONNECTING ROD ASSEMBLY (INCLUDES ITEM 11)	1
11.	06262	BUSHING	1
12.	01105	BEARING, RADIAL	1
13.	06264	RETAINING RING, INTERNAL	1
14.	06265	RETAINING RING, EXTERNAL	1
15.	06238	O–RING	1
16.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16–18 X 1	6
17.	06275	WASHER, SEAL	1
18.	F081305HCS	HEX HEAD CAP SCREW, 1/2–13 X 5/8	1
19.	06169	GEARBOX – S/N BELOW 3700440	1
19.	15872	GEARBOX – S/N 3700440 & ABOVE	1
20.	06274	SEAL, OIL	1
21.	06249	PINION	1
22.	11530	SHOCKMOUNT	2
23.	F051810SCS	SOCKET HEAD CAP SCREW, 5/16–18 X 1–1/4	4
24.	07172	WASHER, HIGH COLLAR	4
25.	F0618SPP	SOCKET PIPE PLUG, 3/8 NPT	1
26.	06925	GASKET	1
27.	06304	PISTON PIN	1
28.	11689	LOCKWASHER, 1/2 CONICAL	4
29.	F081310FSS	FLAT HEAD SOCKET SCREW, 1/2–13 X 1–1/4	4
30.	06908	TUBE	1
31.	06413	VALVE	1
32.	F01PW	PLAINWASHER, #6 SAE	1
33.	06423	SPRING	1
34.	06905	FILTER, BREATHER	1
35.	06910	COVER	1
36.	F08SW	PLAINWASHER, 1/2	1
37.	F081304HCS	HEX HEAD CAP SCREW, 1/2–13 X 1/2	1
38.	06904	BREATHER SUB–ASSEMBLY (INCLUDES ITEMS 30–37)	1
39.	06172	GEARBOX ASSEMBLY (INCLUDES ALL ABOVE EXCEPT 22, 23, 24, 26–29)	1
40.	F042006SCS	SOCKET HEAD CAP SCREW, 1/4–20 X 3/4	6
41.	05968	CAPLUG, KIT OF 12	1

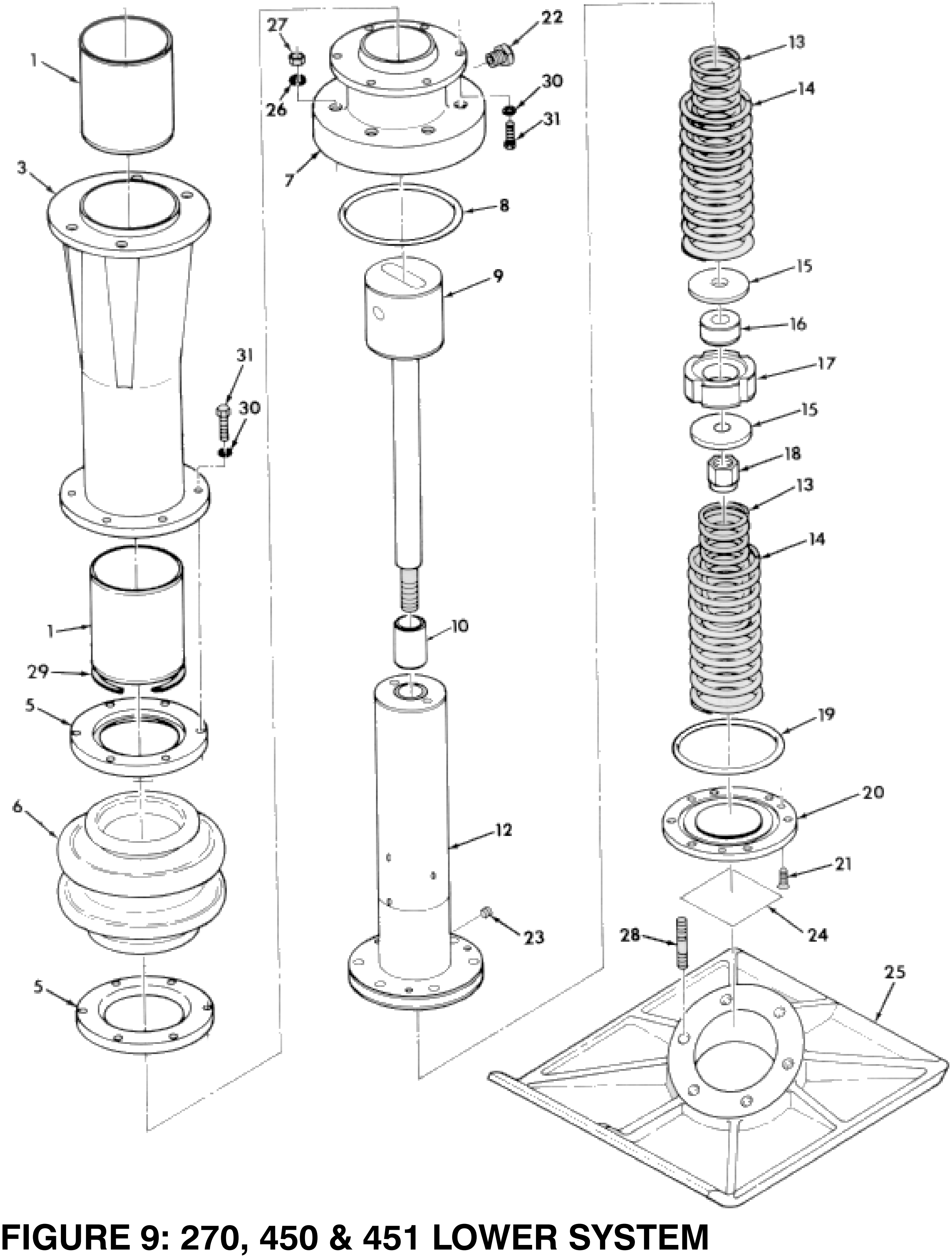


FIGURE 9: 270, 450 & 451 LOWER SYSTEM

270, 450 & 451 LOWER SYSTEM

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06180	BEARING, SLIDE	2
2.			
3.	07163	GUIDE TUBE ASSEMBLY (INCLUDES ITEMS 1 & 29)	1
4.			
5.	07154	CLAMP	2
6.	11694	BELLOWS	1
7.	07153	BELLOW MOUNT	1
8.	06239	O–RING	1
9.	06174	RAM SUB–ASSEMBLY	1
10.	06194	BEARING, BRONZE	1
11.			
12.	06197	SPRING BOX ASSEMBLY, R270 ONLY (INCLUDES ITEM 10)	1
	11696	SPRING BOX ASSEMBLY, R450 & R451 ONLY (INCLUDES ITEM 10)	1
13.	03167	SPRING, COMPRESSION INNER	2
14.	06255	SPRING, COMPRESSION OUTER–270 ONLY	2
	03168	SPRING, COMPRESSION OUTER–R450–R451 ONLY	2
15.	06181	WASHER	2
16.	06399	SPACER	1
17.	06179	PISTON	1
18.	06257	HEX NUT, 7/8–14 ELASTIC LOCK	1
19.	06237	O–RING	1
20.	06173	COVER	1
21.	F042005FSS	FLAT HEAD SOCKET SCREW, 1/4–20 X 5/8	3
22.	06457	GAGE, VIEW	1
23.	F0227SPP	SOCKET PIPE PLUG, 1/8–27	1
24.	01326	DECAL, WARNING SPRING TENSION	1
25.	07507	SHOE, ALUMINUM 11” X 13” R270–R450 ONLY	1
	03172	SHOE, ALUMINUM 13” X 15” R451 ONLY	1
	06159	SHOE, CAST IRON 11” X 13”	1
26.	F07LW	LOCKWASHER, 7/16	6
27.	F0714HN	HEX NUT, 7/16–14	6
28.	07151	STUD, 7/16–14 X 2–5/8	6
29.	07735	RETAINING RING, INTERNAL	1
30.	F04LW	LOCKWASHER, 1/4	12
31.	F042008HCS	HEX HEAD CAP SCREW, 1/4–20 X 1	12
32.	06258	LOWER SYSTEM ASSM R270 ONLY (INCLUDES ALL ABOVE 270 PARTS)	1
	11700	LOWER SYSTEM ASSM R450 ONLY (INCLUDES ALL ABOVE 450 PARTS)	1
	11713	LOWER SYSTEM ASSM R451 ONLY (INCLUDES ALL ABOVE 451 PARTS)	1

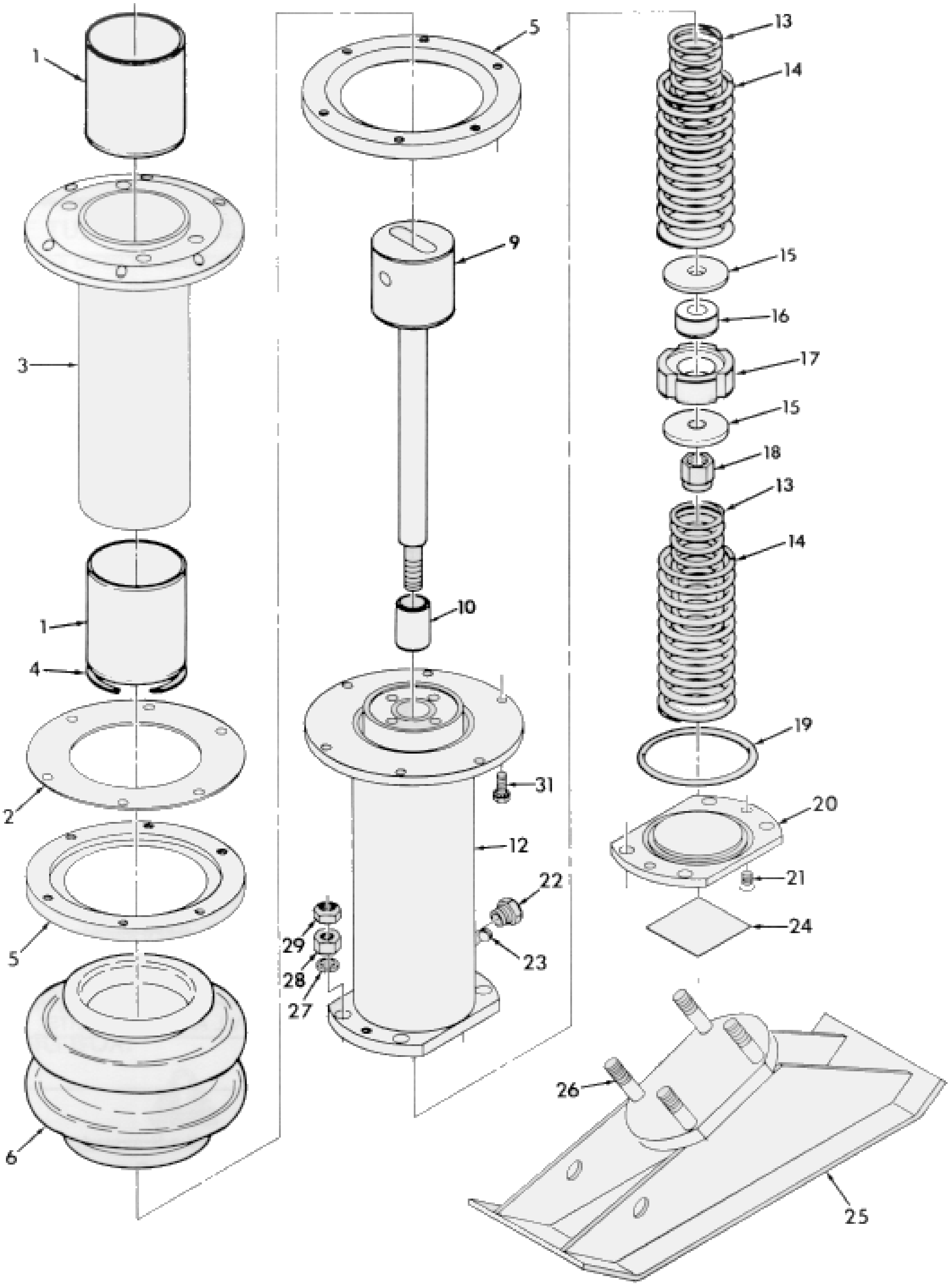


FIGURE 10: 374 & 376 LOWER SYSTEM

374 & 376 LOWER SYSTEM

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06180	BEARING, SLIDE	2
2.	02631	GASKET	1
3.	02038	GUIDE TUBE ASSEMBLY (INCLUDES ITEMS 1 & 4)	1
4.	07735	RETAINING RING, INTERNAL	1
5.	03130	CLAMP	2
6.	11529	BELLOWS	1
7.			
8.			
9.	06174	RAM SUB—ASSEMBLY	1
10.	06194	BEARING, BRONZE	1
11.			
12.	11842	SPRING BOX ASSEMBLY (INCLUDES ITEM 10)	1
13.	03167	SPRING, COMPRESSION INNER	2
14.	03168	SPRING, COMPRESSION OUTER	2
15.	06181	WASHER	2
16.	06399	SPACER	1
17.	06179	PISTON	1
18.	06257	HEX NUT, 7/8—14 ELASTIC LOCK	1
19.	03136	O—RING	1
20.	02606	COVER	1
21.	F042005FSS	FLAT HEAD SOCKET SCREW, 1/4—20 X 5/8	2
22.	06457	GAGE, VIEW	1
23.	F0227SPP	SOCKET PIPE PLUG, 1/8—27	1
24.	01326	DECAL, WARNING SPRING TENSION	1
25.	07956	SHOE, ASSEMBLY, 4” X 18” R374 ONLY (INCLUDES ITEM 26)	1
	07960	SHOE, ASSEMBLY, 6” X 18” R376 ONLY (INCLUDES ITEM 26)	1
26.	03158	STUD, 1/2—13 X 3	4
27.	08504	LOCKWASHER, 1/2 HIGH COLLAR	4
28.	F0813HN	HEX NUT, 1/2—13	4
29.	F0813DLN	LOCKNUT, 1/2—13 DEFORMED	4
30.			
31.	F042007FWS	FLANGE WHIZ LOCK SCREW, 1/2—20 X 7/8	6
32.	11845	LOWER SYSTEM ASSM R374 ONLY (INCLUDES ALL ABOVE W/ 4” SHOE)	1
	11846	LOWER SYSTEM ASSM R376 ONLY (INCLUDES ALL ABOVE W/ 6” SHOE)	1

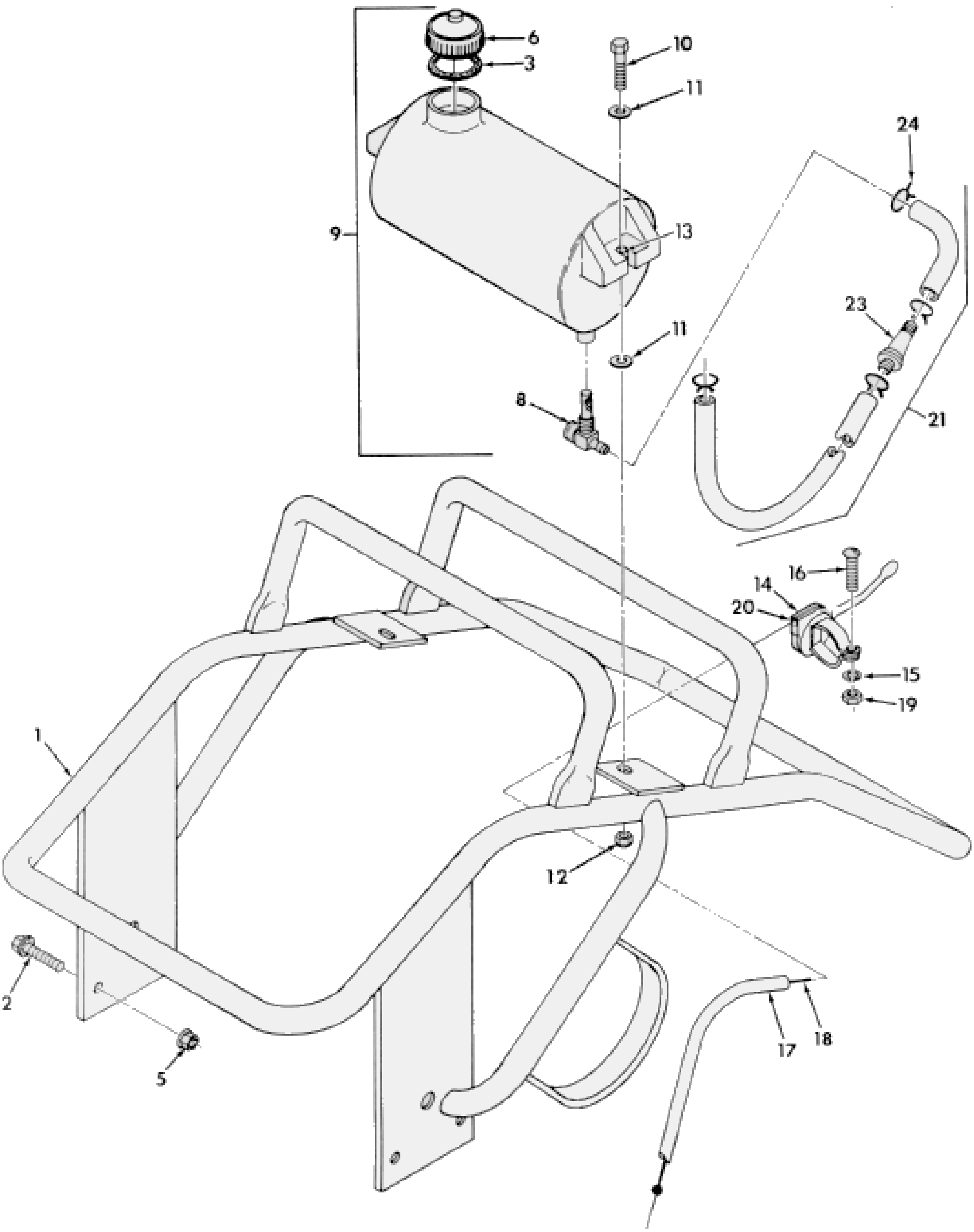


FIGURE 11: 270, 450 & 451 HANDLE

270, 450 & 451 HANDLE

ITEM NO	PART NO	DESCRIPTION	QTY
1.	07915	HANDLE	1
2.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16–18 X 1	4
3.	07763	GASKET	1
4.			
5.	F0518FLN	FLANGE NUT, DEFORMED 5/16–18	4
6.	07758	CAP	1
7.	06631	FOAM, FUEL TANK (NOT SHOWN)	1
8.	03187	VALVE, FUEL	1
9.	07761	TANK ASSEMBLY (INCLUDES ITEMS 6, 7, 8 & 13)	1
10.	F042010HCS	HEX HEAD CAP SCREW, 1/4–20 X 1–1/4	2
11.	F04PW	PLAINWASHER, 1/4 SAE	4
12.	F0420ELN	LOCKNUT, 1/4–20 ELASTIC	2
13.	06903	BUSHING	2
14.	07906	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N BELOW 2717551 (270) AND 4511933 (450/451)	1
14.	14715	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N 2717551 & ABOVE (270), 4511933 & ABOVE (450/451)	1
*15.	F03LW	LOCKWASHER, #10	1
*16.	F033210RMS	ROUND HEAD MACHINE SCREW, #10–32 X 1–1/4	1
17.	07921	CASING	1
18.	07920	WIRE, THROTTLE	1
*19.	F0332HN	HEX NUT, #10–32	1
20.	07916	FERRULE (NOT SHOWN)	
21.	07750	FUEL LINE ASSEMBLY (INCLUDES ITEMS 22, 23 & 24)	1
22.	02308	CLAMP, HOSE PLASTIC	1
23.	01045	FILTER	1
24.	01052	CLAMP, HOSE	3
25.			
26.			
27.			
28.			
29.			
30.			
		*ORIGINAL HARDWARE IS METRIC. WHEN ORDERING REPLACEMENT PARTS, PLEASE ORDER ITEMS 15, 16 & 19 TOGETHER.	

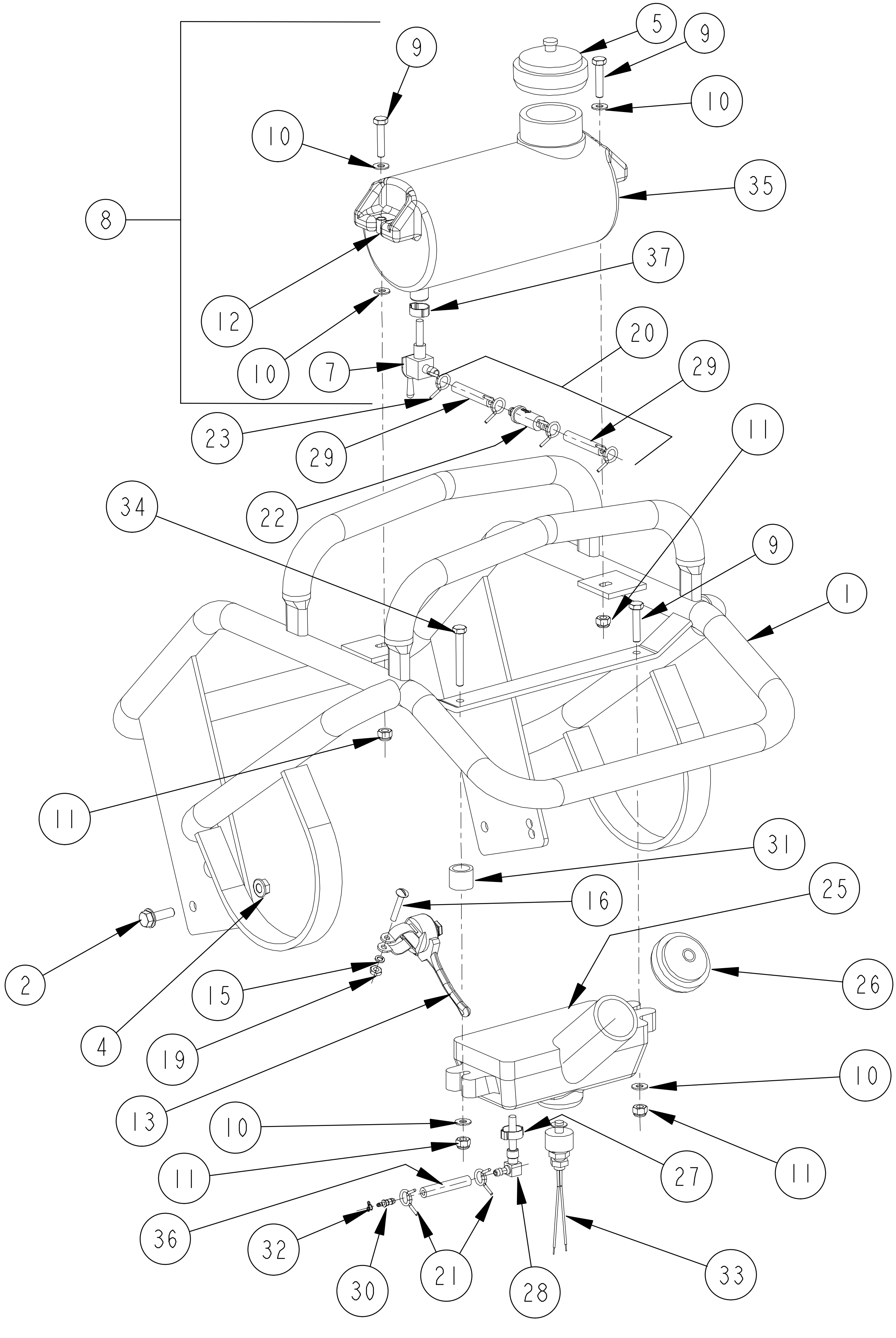


FIGURE 12: STANDARD HANDLE (OIL INJECTED ONLY)

STANDARD HANDLE (OIL INJECTED ONLY)

ITEM NO	PART NO	DESCRIPTION	QTY
1.	14761	HANDLE	1
2.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16–18 X 1	4
3.	07763	FUEL CAP GASKET (NOT SHOWN)	1
4.	F0518FLN	FLANGE NUT, DEFORMED 5/16–18	4
5.	07758	CAP	1
6.	06631	FOAM, FUEL TANK (NOT SHOWN)	1
7.	03187	VALVE, FUEL	1
8.	07761	TANK ASSEMBLY (INCLUDES ITEMS 3, 5, 6, 7, 35 & 37)	1
9.	F042010HCS	HEX HEAD CAP SCREW, 1/4–20 X 1–1/4	3
10.	F04PW	PLAINWASHER, 1/4 SAE	6
11.	F0420DLN	LOCKNUT, 1/4–20 DEFORMED	4
12.	06903	BUSHING	2
13.	14715	THROTTLE ASSEMBLY (INCLUDES ITEM 14)	1
14.	07916	FERRULE (NOT SHOWN)	1
*15.	F03LW	LOCKWASHER, #10	1
*16.	F033210RMS	ROUND HEAD MACHINE SCREW, #10–32 X 1–1/4	1
17.	07887	THROTTLE CABLE CASING (NOT SHOWN)	1
18.	07888	WIRE, THROTTLE (NOT SHOWN)	1
*19.	F0332HN	HEX NUT, #10–32	1
20.	07750	FUEL LINE ASSEMBLY (INCLUDES ITEMS 22, 23 & 29)	1
21.	15016	CLAMP, FUEL LINE HOSE	2
22.	01045	FUEL FILTER	1
23.	01052	CLAMP, FUEL LINE HOSE	4
24.	14725	OIL TANK ASSEMBLY (INCLUDES ITEMS 23, 25, 26, 28, 30, 32 & 33)	1
25.	14508	OIL TANK	1
26.	14714	OIL CAP	1
27.	14925	CLAMP, OIL TANK VALVE	1
28.	14929	OIL TANK FILTER ELBOW	1
29.	00077	1/4” FUEL LINE	2
30.	14762	REDUCER	1
31.	14875	OIL TANK SPACER	1
32.	14979	HOSE CLAMP	1
33.	14981	FLOAT SWITCH	1
34.	F042016HCS	HEX HEAD CAP SCREW 1/4–20 x 2	1
35.	07760	FUEL TANK	1
36.	14930	FUEL LINE 3/16 x 2	1
37.	06945	CLAMP, FUEL TANK VALVE	1
		*ORIGINAL HARDWARE IS METRIC. WHEN ORDERING REPLACEMENT PARTS, PLEASE ORDER ITEMS 15, 16 & 19 TOGETHER.	

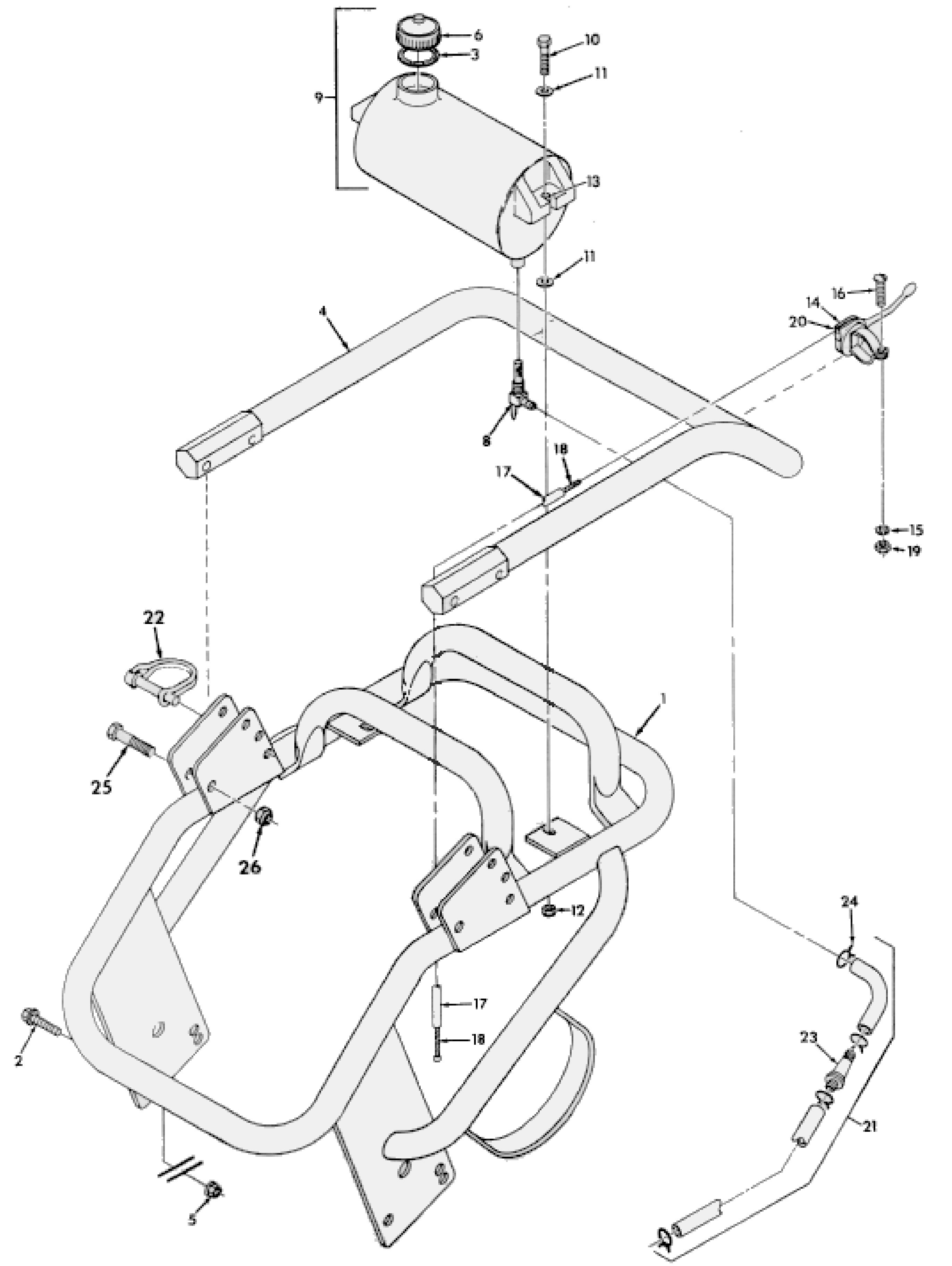


FIGURE 13: 374 & 376 HANDLE

374 & 376 HANDLE

ITEM NO	PART NO	DESCRIPTION	QTY
1.	07861	HANDLE	1
2.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16—18 X 1	4
3.	07763	GASKET	1
4.	07864	HANDLE, ADJUSTABLE	1
5.	F0518FLN	FLANGE NUT, DEFORMED 5/16—18	4
6.	07758	CAP	1
7.	06631	FOAM, FUEL TANK (NOT SHOWN)	1
8.	03187	VALVE, FUEL	1
9.	07761	TANK ASSEMBLY (INCLUDES ITEMS 6, 7, 8 & 13)	1
10.	F042010HCS	HEX HEAD CAP SCREW, 1/4—20 X 1—1/4	2
11.	F04PW	PLAINWASHER, 1/4 SAE	4
12.	F0420ELN	LOCKNUT, 1/4—20 ELASTIC	2
13.	06903	BUSHING	2
14.	07906	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N BELOW 3700441	1
14.	14715	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N 3700441 & ABOVE	1
*15.	F03LW	LOCKWASHER, #10	1
*16.	F033210RMS	ROUND HEAD MACHINE SCREW, #10—32 X 1—1/4	1
17.	07887	CASING	1
18.	07888	WIRE, THROTTLE	1
*19.	F0332HN	HEX NUT, #10—32	1
20.	07916	FERRULE	1
21.	07750	FUEL LINE ASSEMBLY (INCLUDES ITEMS 23 & 24)	1
22.	07865	PIN, SNAPPER 1/4" X 2"	2
23.	01045	FILTER	1
24.	01052	CLAMP, HOSE	4
25.	F051814HCS	HEX HEAD CAP SCREW, 5/16—18 X 1—3/4	2
26.	F0518DLN	LOCKNUT, 5/16—18 DEFORMED	2
		*ORIGINAL HARDWARE IS METRIC. WHEN ORDERING REPLACEMENT PARTS, PLEASE ORDER ITEMS 15, 16 & 19 TOGETHER.	

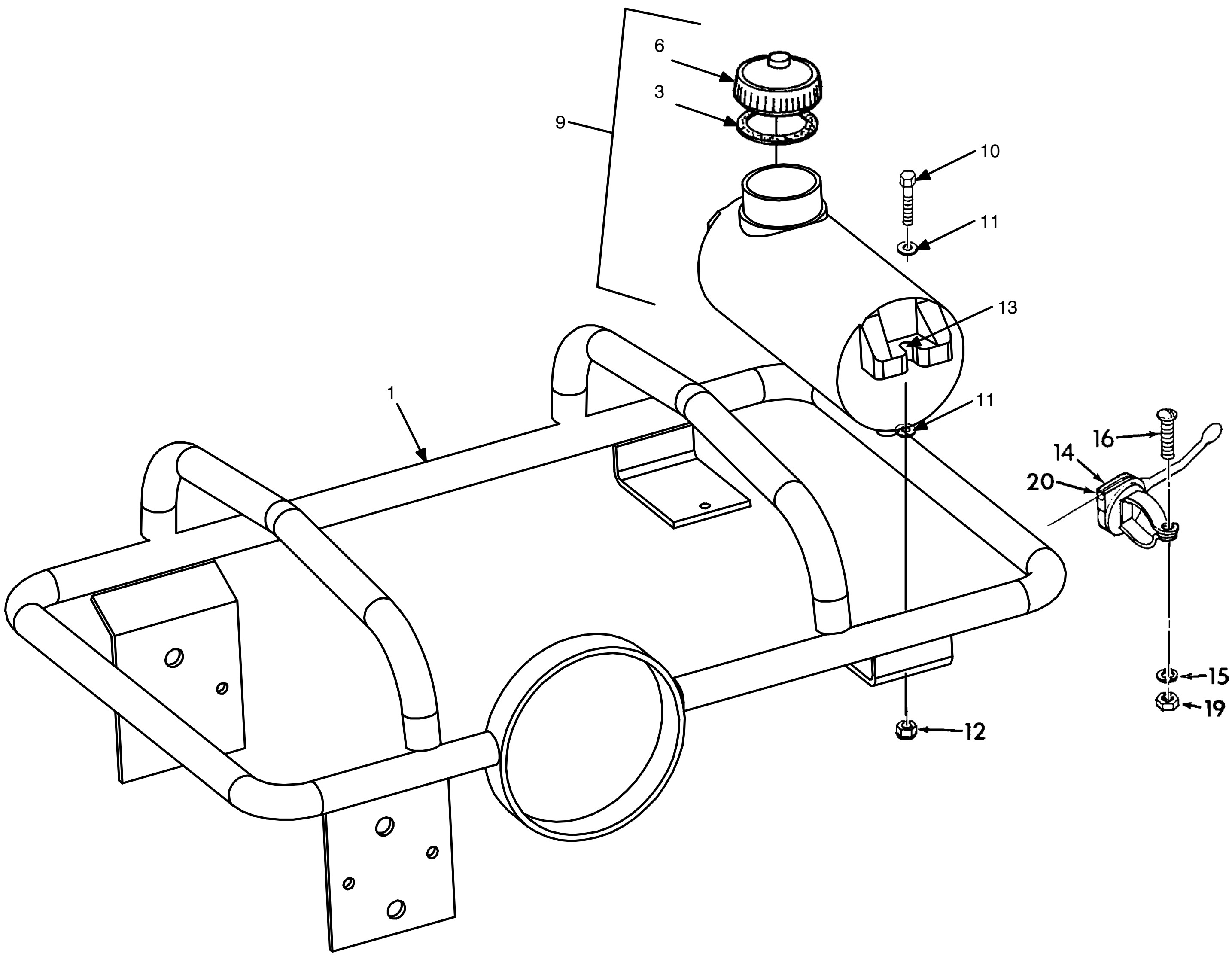


FIGURE 14: LO—PROFILE HANDLE

LO—PROFILE HANDLE

ITEM NO	PART NO	DESCRIPTION	QTY
1.	12865	HANDLE, LO-PROFILE	1
2.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16-18 x 1 (NOT SHOWN)	1
3.	07763	GASKET	4
4.			1
5.	F0518FLN	FLANGE NUT, DEFORMED 5/16-18 (NOT SHOWN)	4
6.	07758	CAP	1
7.	06631	FOAM, FUEL TANK (NOT SHOWN)	1
8.	03187	VALVE, FUEL	1
9.	07761	TANK ASSEMBLY (INCLUDES ITEMS 6, 7, 8 & 13)	1
10.	F042010HCS	HEX HEAD CAP SCREW, 1/4-20 x 1-1/4	2
11.	F04PW	PLAINWASER, 1/4 SAE	4
12.	F0420ELN	LOCKNUT, 1/4-20 ELASTIC	2
13.	06903	BUSHING	2
14.	07906	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N BELOW 2717551 (270) AND 4511933 (450/451)	1
14.	14715	THROTTLE ASSEMBLY (INCLUDES ITEM 20) S/N 2717551 & ABOVE (270), 4511933 & ABOVE (450/451)	1
*15.	F03LW	LOCKWASHER, #10	1
*16.	F033210RMS	ROUND HEAD MACHINE SCREW, #10-32 x 1-1/4	1
17.	07887	CASING	1
18.	07888	WIRE, THROTTLE	1
*19.	F0332HN	HEX NUT, #10-32	1
20.	07916	FERRULE	1
21.	07750	FUEL LINE ASSEMBLY (INCLUDES ITEM 23 & 24)	1
22.	13513	FUEL LINE ASSEMBLY (INCLUDES ITEM 23—26)	1
23.	01045	FILTER (NOT SHOWN)	1
24.	01052	CLAMP, HOSE (NOT SHOWN)	4
25.	01034	HOSE, FUEL 1/4” X 6” (NOT SHOWN)	1
26.	13813	HOSE, FUEL 1/4” X 8—1/2” (NOT SHOWN)	1
		*ORIGINAL HARDWARE IS METRIC. WHEN ORDERING REPLACEMENT PARTS, PLEASE ORDER ITEMS 15, 16 & 19 TOGETHER.	

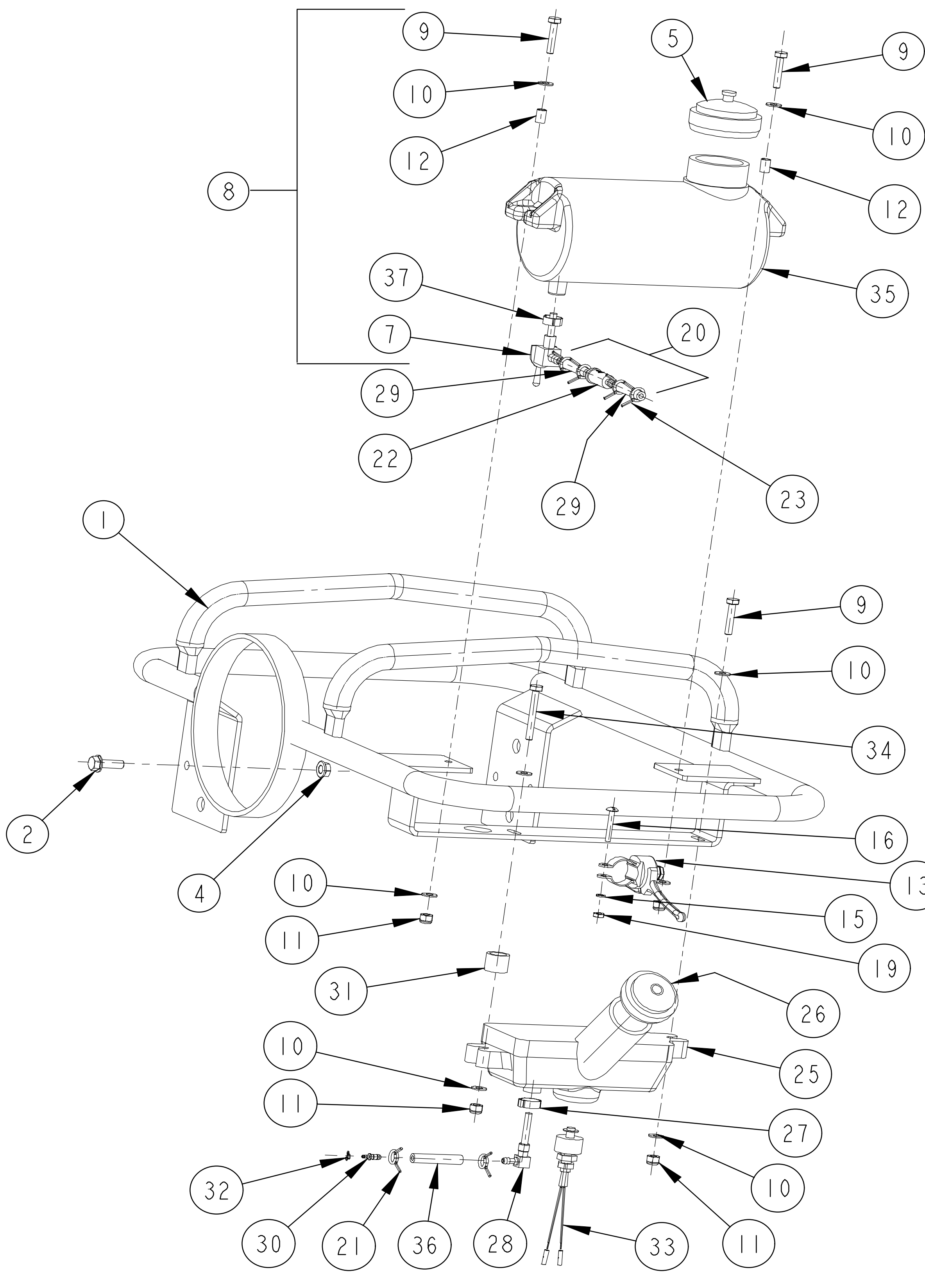


FIGURE 15: LO—PROFILE HANDLE (OIL INJECTED ONLY)

LO—PROFILE HANDLE (OIL INJECTED ONLY)

ITEM NO	PART NO	DESCRIPTION	QTY
1.	14864	HANDLE	1
2.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16—18 X 1	4
3.	07763	GASKET (NOT SHOWN)	1
4.	F0518FLN	FLANGE NUT, DEFORMED 5/16—18	4
5.	07758	CAP	1
6.	06631	FOAM, FUEL TANK (NOT SHOWN)	1
7.	03187	VALVE, FUEL	1
8.	07761	TANK ASSEMBLY (INCLUDES ITEMS 3, 5, 6, 7, 35 & 37)	1
9.	F042010HCS	HEX HEAD CAP SCREW, 1/4—20 X 1—1/4	3
10.	F04PW	PLAINWASHER, 1/4 SAE	6
11.	F0420ELN	LOCKNUT, 1/4—20 ELASTIC	4
12.	06903	BUSHING	2
13.	14715	THROTTLE ASSEMBLY (INCLUDES ITEM 14)	1
14.	07916	FERRULE (NOT SHOWN)	1
*15.	F03LW	LOCKWASHER, #10	1
*16.	F033210RMS	ROUND HEAD MACHINE SCREW, #10—32 X 1—1/4	1
17.	07888	THROTTLE CABLE CASING (NOT SHOWN)	1
18.	07887	WIRE, THROTTLE (NOT SHOWN)	1
*19.	F0332HN	HEX NUT, #10—32	1
20.	07750	FUEL LINE ASSEMBLY (INCLUDES ITEMS 22, 23 & 29)	1
21.	15016	CLAMP, HOSE	2
22.	01045	FILTER	1
23.	01052	CLAMP, HOSE	4
24.	14725	OIL TANK ASSEMBLY (INCLUDES ITEMS 23, 25, 26, 28, 30, 32 & 33)	1
25.	14508	OIL TANK	1
26.	14714	OIL CAP	1
27.	14925	CLAMP, VALVE	1
28.	14929	OIL TANK FILTER ELBOW	1
29.	00077	1/4” FUEL LINE	1
30.	14762	REDUCER	1
31.	14875	OIL TANK SPACER	1
32.	14979	HOSE CLAMP	1
33.	14981	FLOAT SWITCH	1
34	F042016HCS	HEX HEAD CAP SCREW, 1/4”—20 X 2	1
35	07760	FUEL TANK	1
36	14930	3/16” FUEL LINE	1
37	06945	CLAMP, FUEL TANK VALVE	1
		* ORIGINAL HARDWARE IS METRIC, WHEN ORDERING REPLACEMENT PARTS, PLEASE ORDER ITEMS 15, 16 & 19 TOGETHER.	

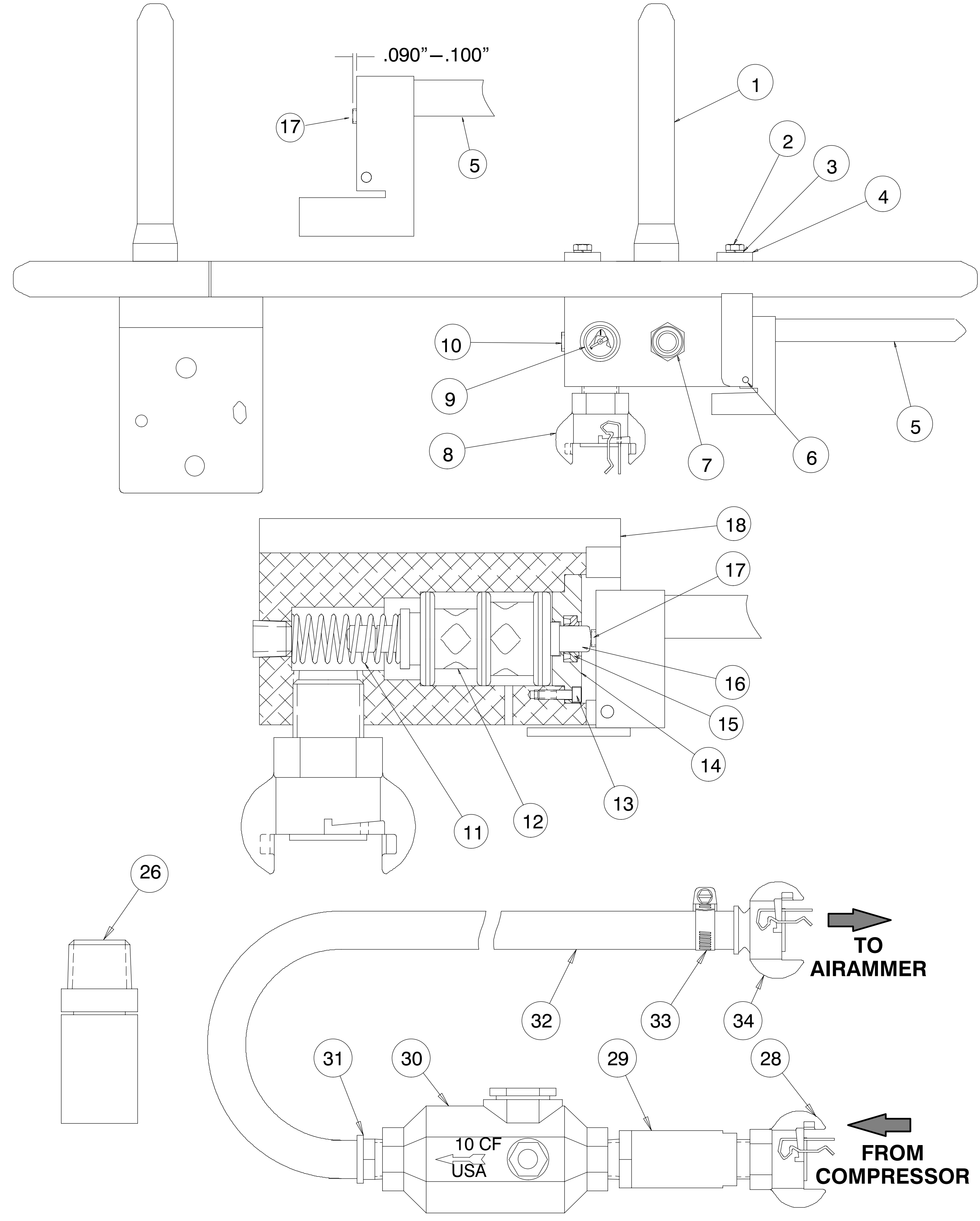


FIGURE 16: AIRAMMER HANDLE

AIRAMMER HANDLE

ITEM NO	PART NO	DESCRIPTION	QTY
1.	11992	HANDLE, AIRAMMER	1
2.	F042010HCS	HEX HEAD CAP SCREW, 1/4–20 X 1–1/4”	4
3.	F04LW	LOCKWASHER, 1/4”	4
4.	12000	CLAMP, VALVE BLOCK	2
5.	11994	ARM, ACTUATOR	1
6.	03821	PIN, GROOVED	2
7.	09255	FITTING, STRAIGHT PARKER 10–6FTX–S	1
8.	03841	FITTING, COUPLER (INCLUDES SAFETY PIN #03842)	1
9.	03823	GAUGE, PRESSURE	1
10.	F0418SPP	SOCKET PIPE PLUG, 1/4–18	1
11.	03812	SPRING, VALVE	1
12.	03811	VALVE	1
13.	F013204SCS	SOCKET HEAD CAP SCREW, #6–32 X 1/2”	3
14.	03806	COVER, MACHINED	1
15.	03810	SEAL, VALVE PIN	1
16.	03809	PIN, VALVE	1
17.	F042804SSSN	SOCKET HEAD SET SCREW, 1/4–28 X 1/2” NYLOC	1
18.	11601	BLOCK, VALVE AIRAMMER	1
19.	11996	ASSEMBLY, AIRAMMER HANDLE (INCLUDES ALL ABOVE)	1
20.	F051808FWS	FLANGE WHIZ LOCK SCREW, 5/16–18 X 1” (NOT SHOWN)	4
21.	F0518FLN	FLANGE LOCKNUT, 5/16–18 DEFORMED (NOT SHOWN)	4
22.	07351	SHOCKMOUNT (270, 374/6, 450/1 AIRAMMER ONLY–NOT SHOWN)	2
		AIRAMMER KITS: SWIVEL & FILTER–LUBRICATOR KITS:	
26.	12247	KIT, SWIVEL AIRAMMER	1
27.	12248	KIT, FILTER–LUBRICATOR AIRAMMER (INCLUDES ITEMS 28–34)	1
28.	03841	FITTING, COUPLER (INCLUDES CLIP #03842)	1
29.	12249	FILTER, AIR ARROW 9076M	1
30.	12250	TANK, LUBRICATOR ASL 10–CF	1
31.	12252	FITTING, STRAIGHT PARKER 30182–12–12	1
32.	09814	HOSE, 3/4” ID LOW PRESSURE	5’
33.	12253	CLAMP, HOSE	1
34.	12251	FITTING, COUPLER HOSE BARB (INCLUDES CLIP #03842)	1

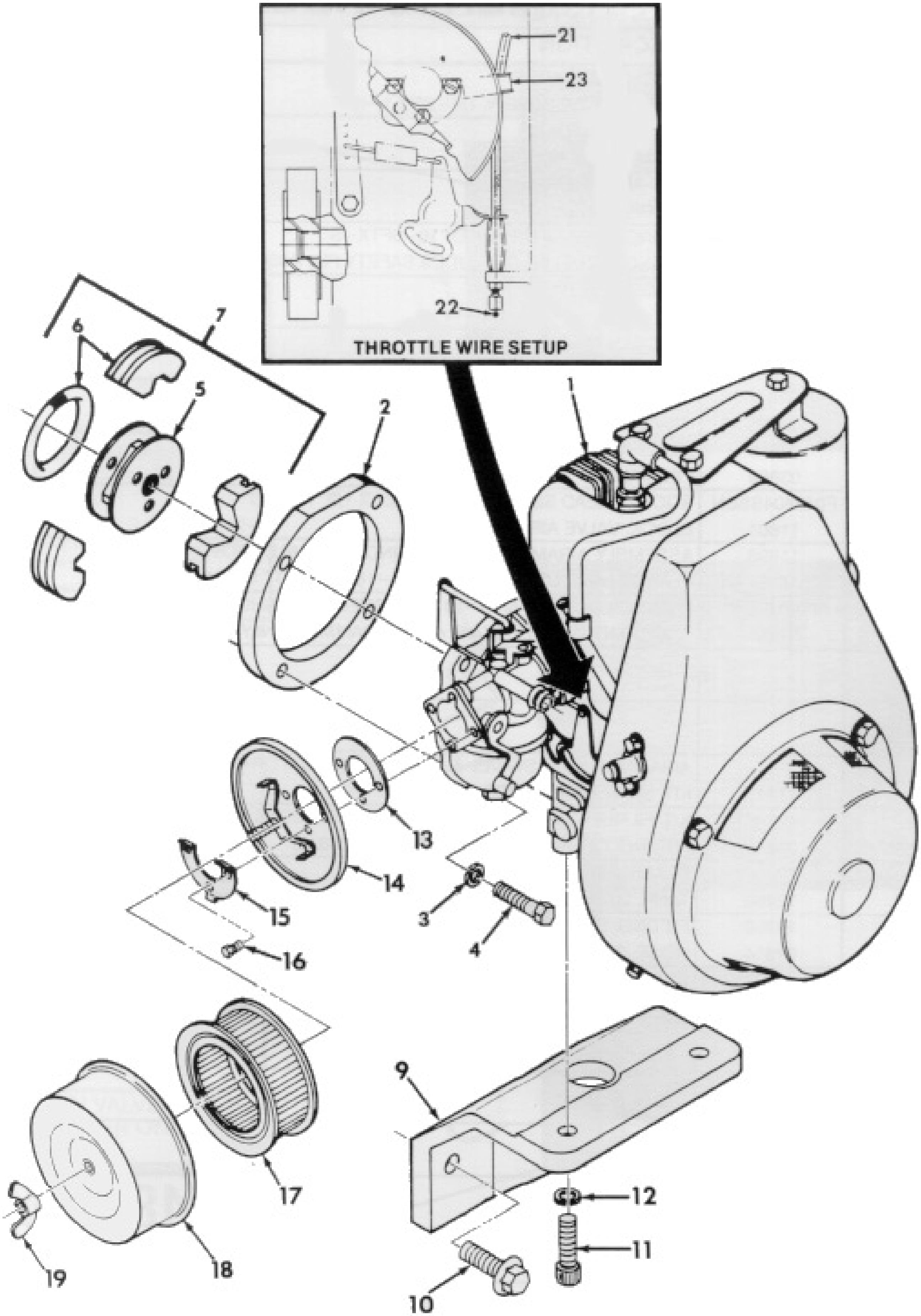


FIGURE 17: ROBIN ENGINE

ROBIN ENGINE ASSEMBLY

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06420	ENGINE, ROBIN EC10D (FLOAT CARBURETOR)	1
2.	06388	SPACER	1
3.	F06LW	LOCKWASHER, 3/8”	4
4.	F061614HCS	HEX HEAD CAP SCREW, 3/8—16 X 1—3/4”	4
5.	07503	HUB, CLUTCH CAST	1
6.	06026	KIT, SHOE AND SPRING	1
7.	07515	CLUTCH, CAST HUB (INCLUDES ITEMS 5 & 6)	1
8.			
9.	06926	BRACKET	1
10.	F061608FWS	FLANGE WHIZ LOCK SCREW, 3/8—16 X 1”	2
11.	06747	SOCKET HEAD CAP SCREW, M8 X 25 mm	2
12.	F05LW	LOCKWASHER, 5/16	2
13.	06446	GASKET	1
14.	07565	BASE	1
15.	07570	TABLOCK	1
16.	07563	HEX HEAD CAP SCREW, M5 X 10 mm SLOTTED	3
17.	K230840	ELEMENT	1
18.	07566	COVER	1
19.	F0420EWN	WINGNUT, 1/4—20 ELASTIC	1
20.			
21.	07921	CASING (270, 450 & 451)	1
	07887	CASING (374 & 376)	1
22.	07920	WIRE, THROTTLE (270, 450 & 451)	1
	07888	WIRE, THROTTLE (374 & 376)	1
23.	07616	CLAMP	1
		FOR A COMPLETE ENGINE BREAKDOWN, CONTACT YOUR AUTHORIZED ROBIN ENGINE DISTRIBUTOR.	

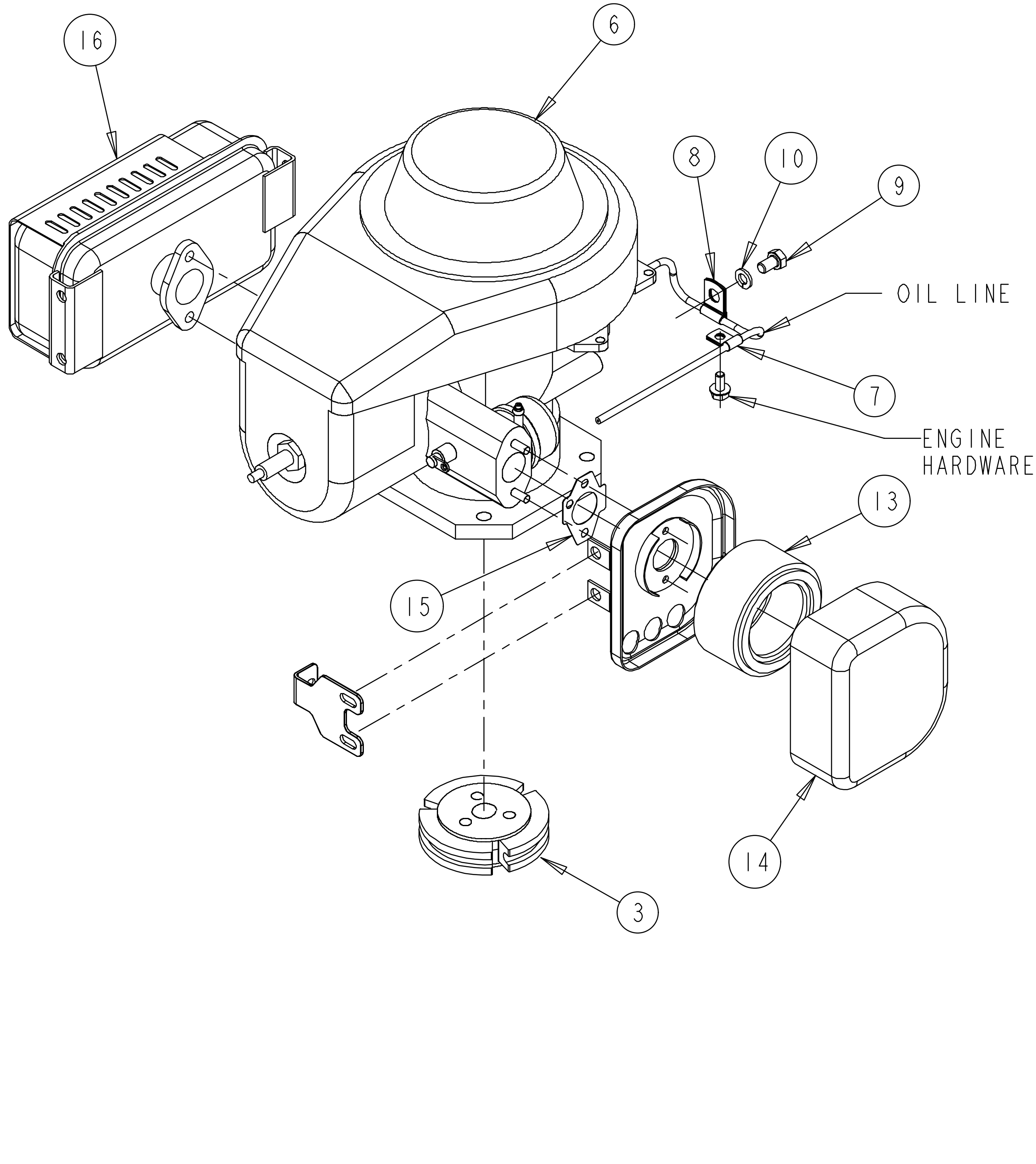
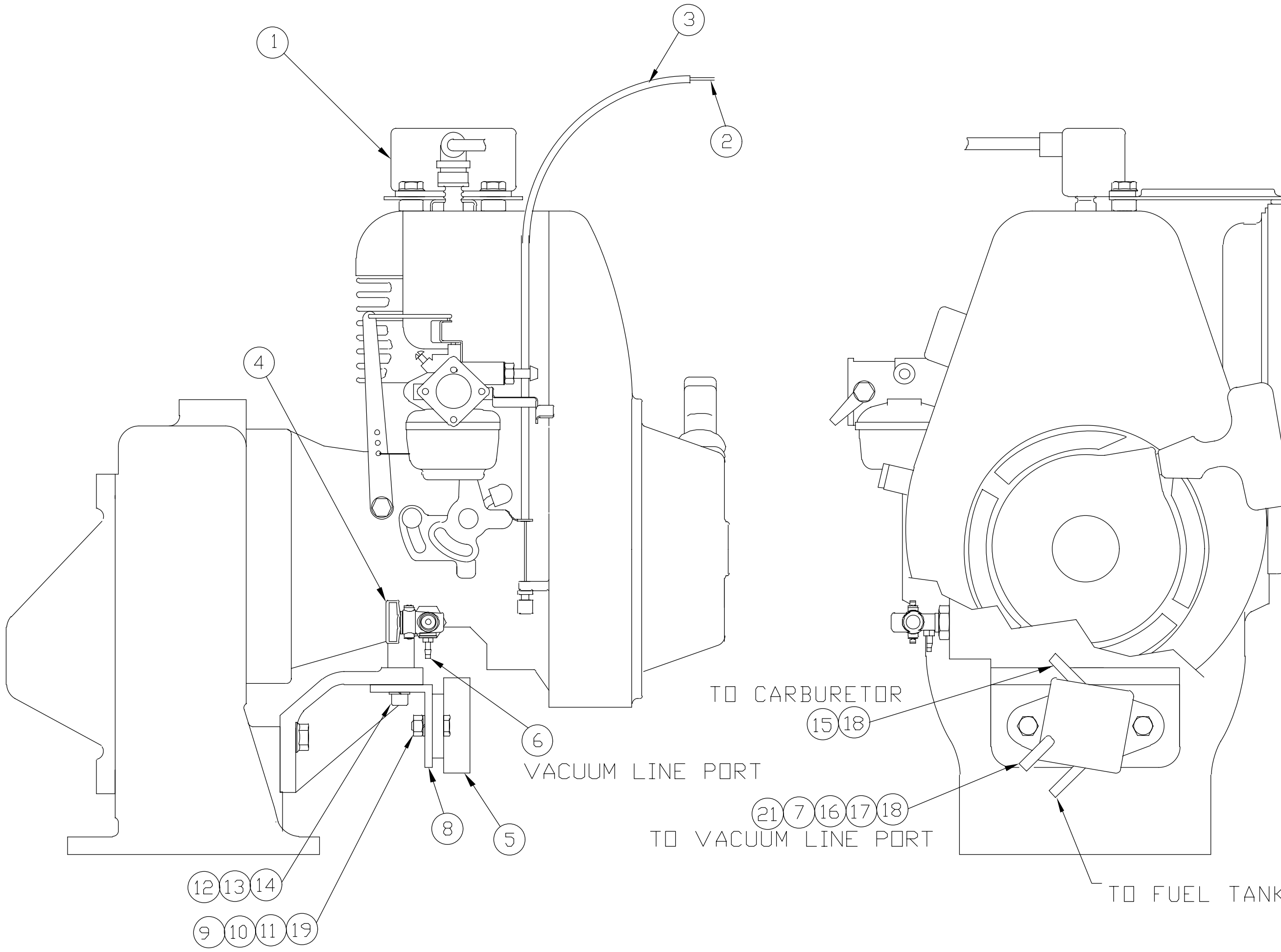


FIGURE 18: ROBIN OIL INJECTED ENGINE

ROBIN OIL INJECTED ENGINE ASSEMBLY

ITEM NO	PART NO	DESCRIPTION	QTY
1.	06026	KIT, SHOE AND SPRING	1
2.	07503	HUB, CLUTCH	1
3.	07515	CLUTCH, HUB ASSEMBLY (INCLUDES ITEMS 1 & 2)	1
4.	07887	CASING, THROTTLE (NOT SHOWN)	1
5.	07888	WIRE, THROTTLE (NOT SHOWN)	1
6.	14600	ENGINE, ROBIN EC12	1
7.	14946	CLAMP, OIL LINE, 1/2”	1
8.	15192	CLAMP, OIL LINE, 1/2”	1
9.	15194	HEX HEAD CAP SCREW, M8—1.25 X 14mm	1
10.	F05LW	LOCKWASHER, 5/16”	1
11.	F06LW	LOCKWASHER, 3/8” (NOT SHOWN)	4
12.	F061614HCS	HEX HEAD CAP SCREW, 3/8—16 X 1-3/4” (MTG BOLT)[NOT SHOWN]	4
13.	157-32600-07	ELEMENT	1
14.	161-32635-18	COVER	1
15.	161-35201-01	GASKET	1
16.	161-30101-11	MUFFLER	1
		FOR A COMPLETE ENGINE BREAKDOWN, CONTACT YOUR AUTHORIZED ROBIN ENGINE DISTRIBUTOR	



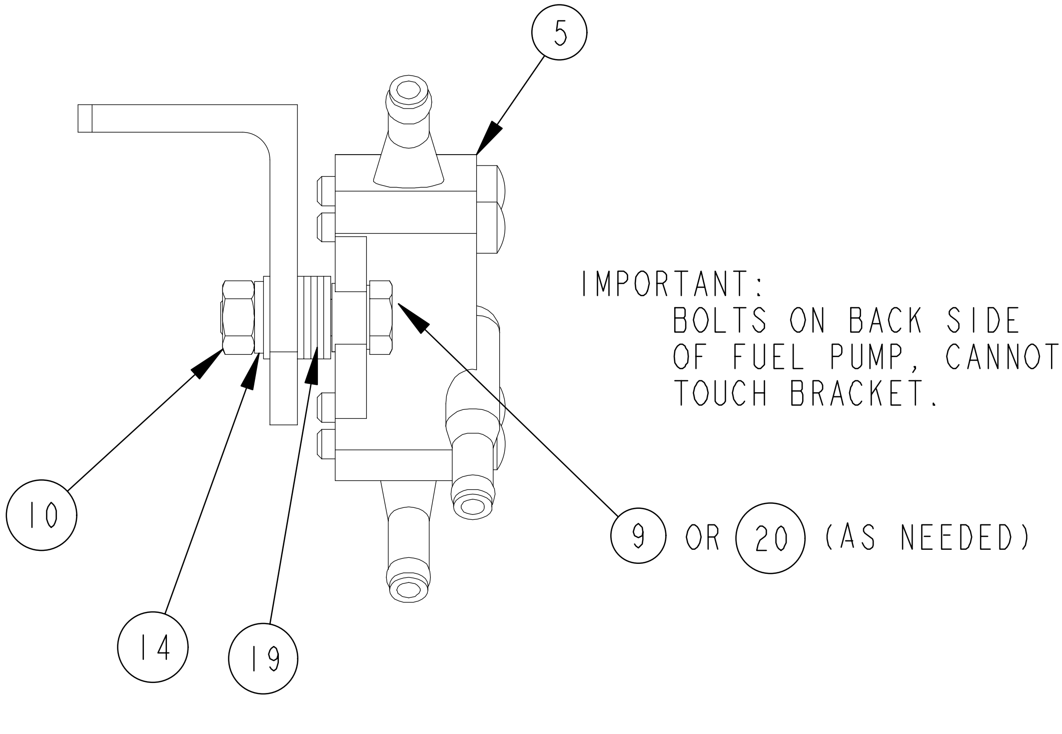
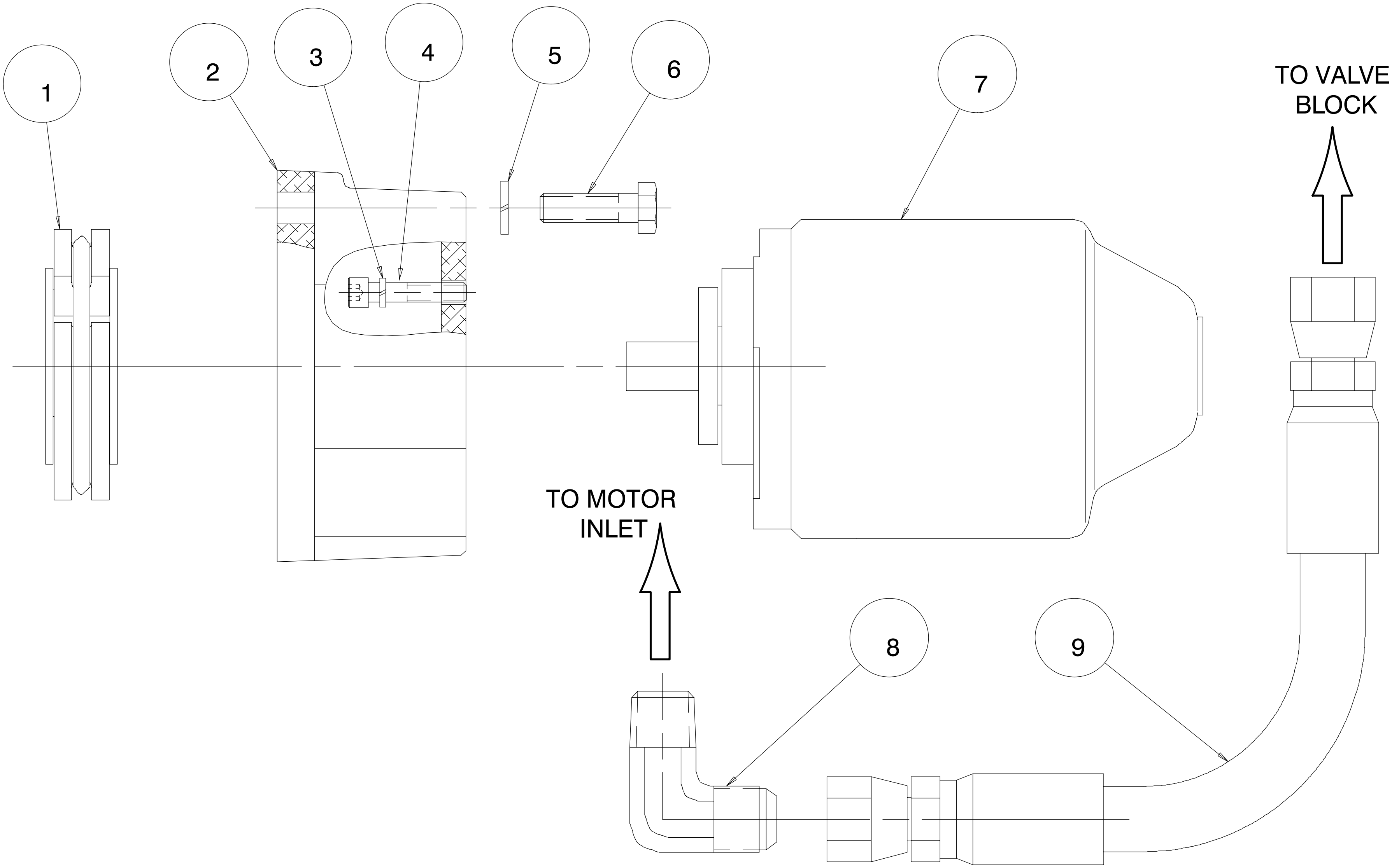


FIGURE 19: LO–PROFILE ROBIN ENGINE

LO—PROFILE ROBIN ENGINE ASSEMBLY

ITEM NO	PART NO	DESCRIPTION	QTY
1.	12848	SHROUD, SPARK PLUG	1
2.	07920	WIRE, THROTTLE	1
3.	07921	CASING	1
4.	15797	DRAIN VALVE, MACHINED	1
5.	12861	PUMP, FUEL	1
6.	15781	HOSE BARB, BRASS	1
7.	15927	HOSE REDUCER, PLASTIC 1/4 X 1/8	1
8.	13799	BRACKET, FUEL PUMP	1
9.	F042006HCS	HHCS, 1/4-20 x 3/4 LG	2
10.	F0420HN	NUT, HEX 1/4-20	2
11.	F04LW	LOCKWASHER 1/4	2
12.	10119	BOLT, SHCS M8 x 30 mm	2
13.	F05SW	PLAINWASHER, 5/16	2
14.	F05LW	LOCKWASHER, 5/16	2
15.	02293	HOSE, FUEL	1
16.	15783	HOSE, 3/32 I.D. (VACUUM LINE)	1
17.	01035	HOSE, FUEL	1
18.	01052	CLAMP, HOSE	4
19.	F04PW	PLAINWASHER, 1/4 (AS NEEDED)	12
20.	F042008HCS	HHCS, 1/4—20 X 1 LG (AS NEEDED)	2
21.	14979	CLAMP, HOSE (5/32)	2
		FOR A COMPLETE ENGINE BREAKDOWN, CONTACT YOUR AUTHORIZED ROBIN ENGINE DISTRIBUTOR	

FIGURE 20: AIRAMMER MOTOR



AIRAMMER MOTOR ASSEMBLY

ITEM NO	PART NO	DESCRIPTION	QTY
1.	11999	CLUTCH, AIRAMMER	1
2.	12190	FLANGE, TCS	1
3.	F04HCLW	LOCKWASHER, HIGH COLLAR 1/4”	3
4.	F042012SCS	SOCKET HEAD CAP SCREW, 1/4—20 X 1—1/2”	3
5.	F06LW	LOCKWASHER, 3/8”	4
6.	F061610HCS	HEX HEAD CAP SCREW, 3/8—16 X 1—1/4”	4
7.	12189	MOTOR, PNEUMATIC	1
8.	12199	FITTING, ELBOW PARKER 10—CTX—S	1
9.	10099	HOSE, 5/8” X 22”	1